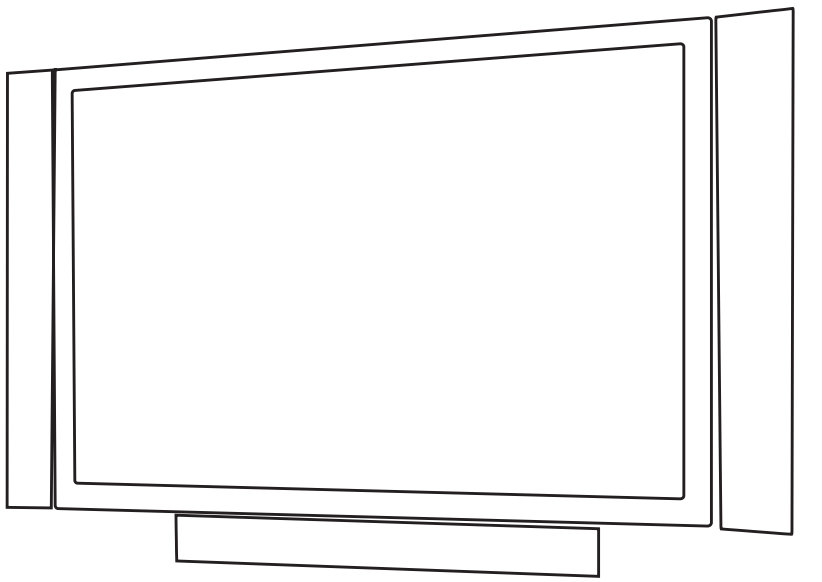
Service Manual

42” PLASMA PDP MONITOR

CHASSIS : SP-120

MODEL : PDS4250



Caution

: In this Manual, some parts can be changed for improving. their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List)in Service Information Center(http://svc.dwe.co.kr)

http : //svc.dwe.co.kr

NOV.2003

Contents

I. Parts with the exception of MODULE

1. Safety Precautions ····3
2. Product Specification
   2-1. SPECIFICATION ····4
   2-2. Available Input Signal ····6
3. BLOCK DIAGRAM ····8
4. Description Of Each BLOCK
   4-1. A/V BLOCK ····9
      4-1-1. A/V BLOCK DIAGRAM ····9
      4-1-2. VIDEO PCB ····10
      4-1-3. JACK PCB ····14
      4-1-4. KEY PCB ····15
      4-1-5. LED PCB ····15
   4-2. POWER PCB ····16
   4-3. BASIC CONGIFURATION ····17
5. SERVICE MODE
   5-1. Entering SERVICE MODE ····18
   5-2. Default Values For SERVICE MODE Items ····18
   5-3. Description Of SERVICE MODE Items ····19
6. Adjusting Method
   6-1. Adjusting WHITE BALANCE ····23
   6-2. Adjusting POWER PCB ····23
7. SOFTWARE UPGRADE Method ····25
8. Main PCB Trouble Diagnosis ····28
   8-1. VIDEO & JACK PCB Trouble Diagnosis ····28
   8-2. POWER PCB Trouble Diagnosis ····33
9. TROUBLE SHOOTING
   9-1. Facts You Must Know When Diagnosing And Repairing ····34
   9-2. Representative Symptoms When Each PCB Breaks Down ····34
   9-3. Trouble Diagnosis And Repairing Method For Representative Symptoms ····35
10. ASSEMBLY LIST ····39
11. EXPLODED VIEW ····42

II. Parts of MODULE

1. Safety Precautions ····43
2. Formation and Specification of Module ····46
3. Adjustment ····47
4. Trouble Shooting ····52
   4-1 Checking for No Picture ····52
   4-2 Hitch Diagnosis Following Display Condition ····54

4-2-1. 4/7 or 3/7 of the screen doesn’t be shown ……54
4-2-2. Screen doesn’t be shown as Data COF ……54
4-2-3. It is generated unusual pattern of Data COF IC unit ……55
4-2-4. Regular Stripe is generated about the quantity of one Data COF IC or more ……56
4-2-5. Screen doesn’t be shown at all as scan COF ……56
4-2-6. Regular stripe is generated at regular internal on the whole screen ……57
4-2-7. Data copy is generated to stripe direction ……57
4-2-8. One or more stripe is generated on the screen ……58
4-2-9. One or more horizontal line is generated on screen ……58
4-2-10. Lightness of screen is wholly darken though there is input-signal-pattern ……58
4-2-11. Different color is shown partially during full-white-screen or electric discharge is generated during full-black-screen ……59
4-2-12. Full-white pattern it happened that the lightness of middle is darken while full-white pattern ……59
4-2-13. Some lightness of some color doesn’t not generated well ……59
5. Block Diagram of Module ……60

I. Parts with the exception of MODULE

1. Safety Precautions

1. Safety Precautions

(1) When moving or laying down a PDP Set, at least two people must work. Avoid any impact towards the PDP Set.

(2) Do not leave the broken PDP Set on for a long time. To prevent any further damages, after check the condition of the broken Set, make sure to turn the power (AC) off.

(3) When opening the BACK COVER, turn off the power (AC) to prevent electric shock. When a PDP is on, high voltage and high current exist inside the Set.

(4) When loosening screws, check the connecting position and type of the screw. Sort out the screws and store them separately. Because screws holding PCB are working as electric circuit GROUNDING, make sure to check if any screw is missing when assembling.

(5) If you open the BACK COVER, you will see a Panel Gas Exhaust Tube (Fig. 1). If this part is damaged, entire PDP PANEL must be replaced. Therefore, when working, be careful not to damage this part.

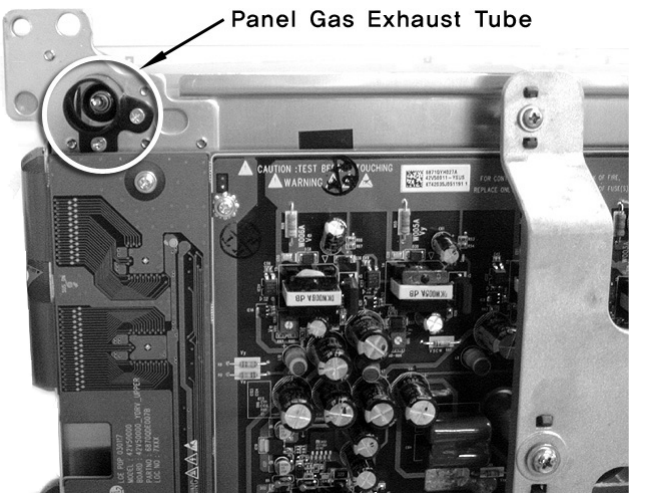


Fig 1. Panel Gas Exhaust Tube

(6) A PDP Set contains a different kind of connector cables. When connecting or disconnecting connector cables, check the direction and position of the cable beforehand.

(7) When disconnecting connectors, unplug the connectors slowly with care. Especially when connecting/disconnecting FFC (film) cables or FPC cables, do not unplug the connectors too much instantaneously or strongly, and always handle the cables with care.

(8) Connectors are designed so that if the number of pins or the direction does not match, connectors will not fit. When having problem in plugging the connectors, make sure to check their kind, position, and direction.

2. Product Specification

2-1. SPECIFICATION

ITEM	SPECIFICATION	REMARK
1. GENERAL		
1-1. MODEL NO	DSP-4222LVS(G, W)	
1-2. CHASSIS NO	SP-120	
1-3. SCREEN SIZE	42"(16:9)	
1-4. COUNTRY	Europe	
1-5. RESOLUTION	852(H) X 480(V)	
1-6. REMOCON TYPE	R-V2A02	
1-7. SAFETY STANDARD	CE(CLASS B), CB	
2. MECHANICAL		
2-1. APPEARANCE		
1) WITHOUT STAND	WxHxD=1,044 x 631 x 82.8 mm	
2) WITH STAND	WxHxD=1,044 x 705.9 x 310 mm	
3) CARTON BOX	WxHxD=1,256 x 800 x 327 mm	
2-2. WEIGHT		
1) WITHOUT STAND	28.2 Kg	
2) WITH STAND	32.7 Kg	
3. ELECTRICAL		
3-1. VIDEO INPUT	COMPOSITE (NTSC, PAL, SECAM, PAL-M/N, NTSC4.43) & S-VHS (50/60Hz Y/C) 1 PORTS SCART(CVBS/RGB) 2 PORTS	
3-2. DTV/DVD INPUT	1080i, 720P, 480P , 480i (Y, Pb/Cb, Pr/Cr, COMPONENT SIGNAL) 2 PORTS	
3-3. PC INPUT	VGA ~ UXGA (15 PIN D-SUB) 1 PORT	
3-4. DVI INPUT	DVI-D(DVI JACK) 1 PORT	
3-5. SOUND INPUT	VIDEO 3 PORTS, DTV/DVD 2 PORTS,PC 1 PORT,DVI 1 PORT	
3-6. SPEAKER OUTPUT	8W(R) + 8W(L)	
3-7. POWER REQUIREMENT	AC 100V~240V, 50/60Hz	
3-8. POWER CONSUMPTION	320W	
3-9. RS-232 CONTROL	COMMUNICATION (EXTERNAL UPGRADE)	
3-10. FUNCTION		
1) SCREEN MODE	*PC: H/V SIZE AND POSITION ADJUSTMENT *VIDEO : AUTO,16:9,PANORAMA,ENLARGE LB, ENLARGE LBS *DTV/DVD : AUTO,16:9	
2) ZOOM	20 STEP ZOOM	
3) OSD	11 LANGUAGES (ENGLISH,KOREAN,GERMAN,ITALIAN, DUTCH,PORTUGUESE,SPANISH,MEXICAN,RUSSIAN, CHINESE,FRANCH)	
4) OTHERS	STILL, SLEEP MODE , SOUND MODE	

ITEM	SPECIFICATION	REMARK
4. OPTICAL		
4-1. SCREEN SIZE	42"(106Cm) DIAGONAL	
4-2. ASPECT RATIO	16:9	
4-3. NUMBER OF PIXELS	852(H)X480(V)	
4-4. DISPLAY COLOR	16,700,000 COLOR(EACH 8BITS FOR RGB)	
4-5. CELL PITCH	1.08(H)X1.08(V)	
4-6. PEAK LUMINANCE	300cd/m^2(WITH FILTER GLASS)	MIK7253
4-7. CONTRAST RATIO	1000:1	(NO.8)
4-8. VIEWING ANGLE	160(VERTICAL/HORIZONTAL)	
5. USERCONTROL & ACCESSORIES		
5-1 CONTROL BUTTON(SET)	AC POWER BUTTON(PUSH-PULL S/W) MENU, SELECT, UP, DOWN, LEFT, RIGHT(SOFT S/W)	
5-2. REMOTE CONTROL (R-V2A02)	POWER, INPUT SELECT, CONFIRM (or OK), EXTENSION -, EXTENSION +, MENU, UP, DOWN, VOLUME UP, VOLUME DOWN, SILENCE, PICTURE MODE, PICTURE STILL, PICTURE SIZE, SOUND MODE, TIMER SLEEP	
5-3. ACCESSORIES	REMOTE CONTROLLER,BATTERY,INSTRUCTION MANUAL, A/V CABLE, PC CABLE, POWER CORD OPTION : STAND WALL HANGER, SPEAKER R/L	

2-2. Available Input Signal

(1) PC

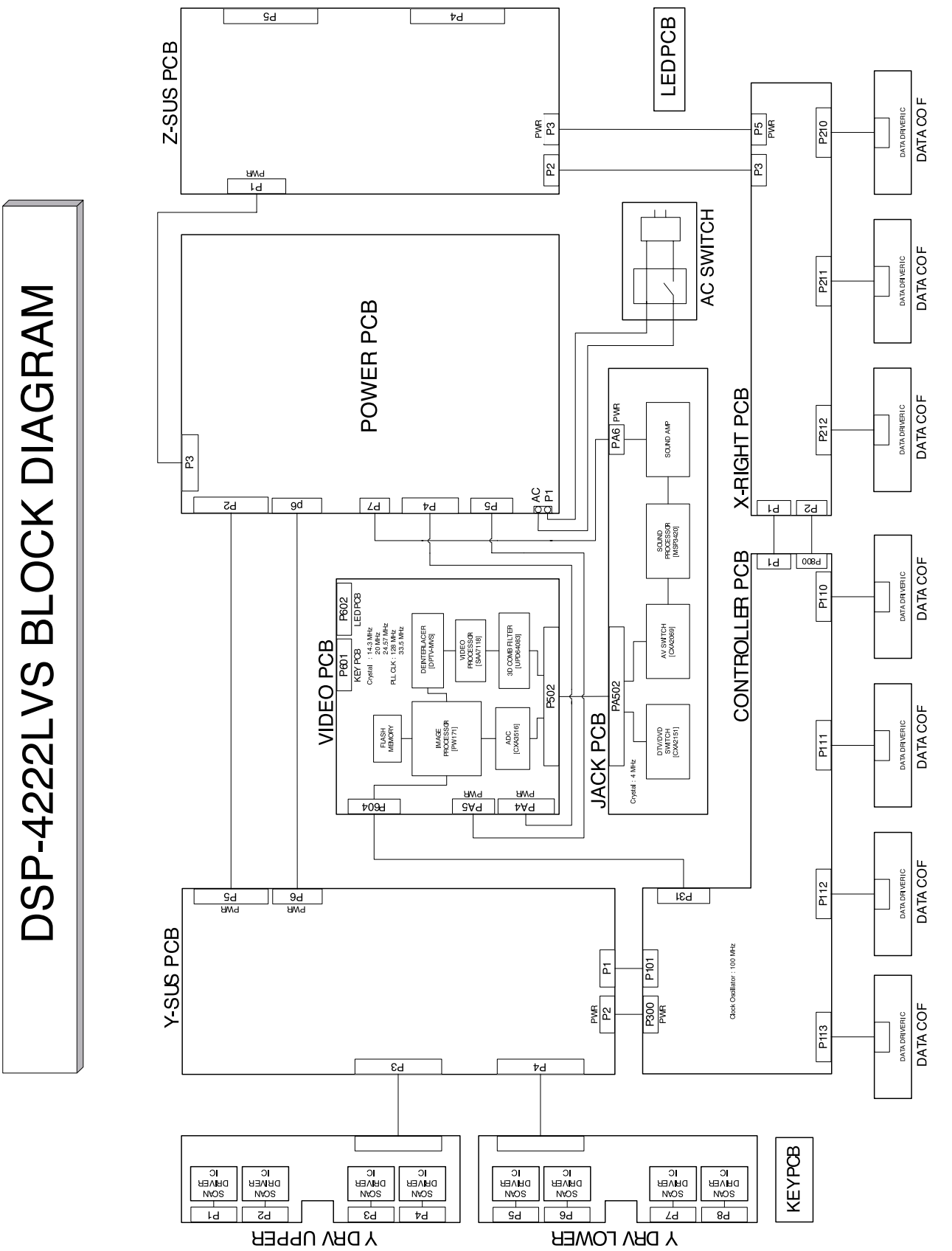
Resolution	H Freq. (KHz)	V Freq. (Hz)	Remark	Patt No.
640x350	31.469	70.1	IBM	203
	37.861	85.1	VESA	11
640x400	24.823	56.4	NEC	15
	30.48	60.0	PGA	871
	31.469	70.1	IBM (DOS)	204
	37.861	85.1	VESA	16
640x480	31.469	59.9	DOS	17
	35	66.7	Macintosh	18
	37.861	72.8	VESA	19
	37.5	75.0	VESA	20
	39.375	75.0	IBM	21
	43.269	85.0	VESA	22
720x400	31.47	60.0	VGA	876
	31.469	70.1	IBM	13
	37.927	85.1	VESA	14
720X480	31.54	60.0	480P	953
720X576	15.63	25.0	PAL	950
800x600	35.156	56.3	VESA	23
	35.16	57.2	VESA	24
	37.879	60.3	VESA	24
	48.077	72.2	VESA	25
	46.875	75.0	VESA	26
	53.674	85.1	VESA	27
832x624	49.726	74.0	Macintosh	28
1024x768	48.193(48.077)	59.3(59.8)	Macintosh(OAK)	29
	48.363	60.0	VESA	30
	53.95	66.1	XGA	890
	56.476	70.1	HP&VESA	31
	60.241	74.9(74.6)	Macintosh	32
	60.023	75.0	VESA	33
	68.677	85.0	VESA	34
	80.66	100.0	Fujitsu	939
	70.84	84.0	SUN	926
1152X864	54	60.0	VAX	936
	63.851	70.0	VESA	35
	67.5	75.0	VESA	36
	77.094	85.0	VESA	37
1152x900	61.796	66.0	SUN	38
	71.713	76.0	SUN	39
1280X720	45	60.0	720P	954
1280X960	60	60.0	VESA	40
	75	75.0	VESA	41
	85.938	85.0	VESA	42

Resolution	H Freq. (KHz)	V Freq. (Hz)	Remark	Patt No.
1280X1024	46.433	43.4	VESA	205
	63.981	60.0	VESA	44
	70.66	66.5	VAX	937
	74.88	70.0	NEC	921
	78.125	72.0	HP & HITA	206
	78.855	74.1	Sony & NEC	46
	79.976	75.0	VESA	47
	81.13	76.1	SUN	927
	91.146	85.0	VESA	48
1600X1200	62.5	48.0	VESA	
	75	60.0	VESA	50
	81.25	65.0	VESA	862
	87.5	70.0	VESA	863
	93.75	75.0	VESA	864
	100	80.0	VESA	865

(2) DTV
-1080i/ 60 Hz
-720P / 60 Hz
-480P / 60 Hz

(3) VIDEO
-PAL, PAL-M, PAL-N
-NTSC , NTSC4.43
- SECAM

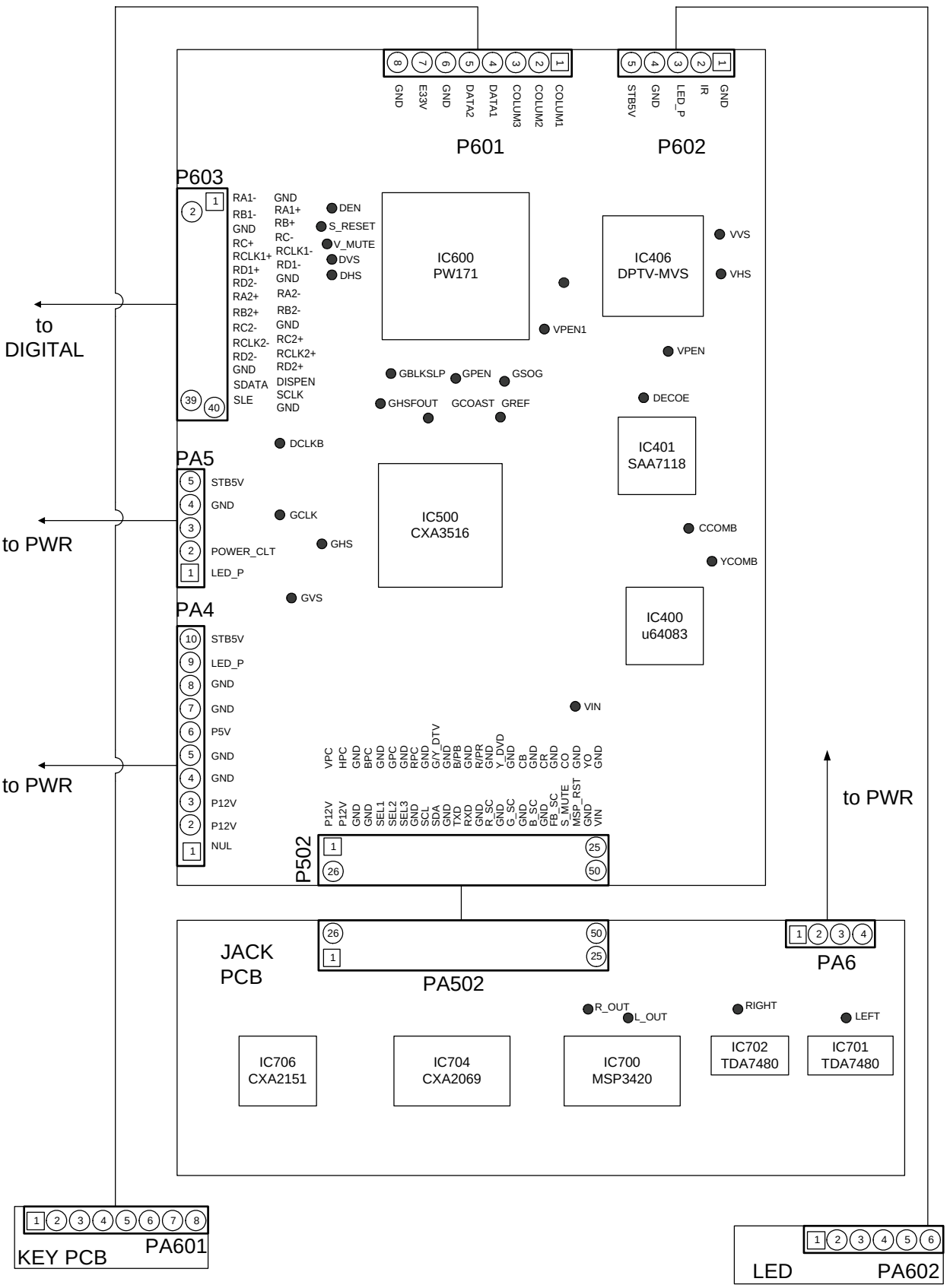
3. BLOCK DIAGRAM



4. Description Of Each BLOCK

4-1. A/V BLOCK

4-1-1. A/V BLOCK DIAGRAM



4-1-2.VIDEO PCB

- PROCESS Various Signal (PC, COMPONENT, COMPOSITE) to produce 24BIT DIGITAL output

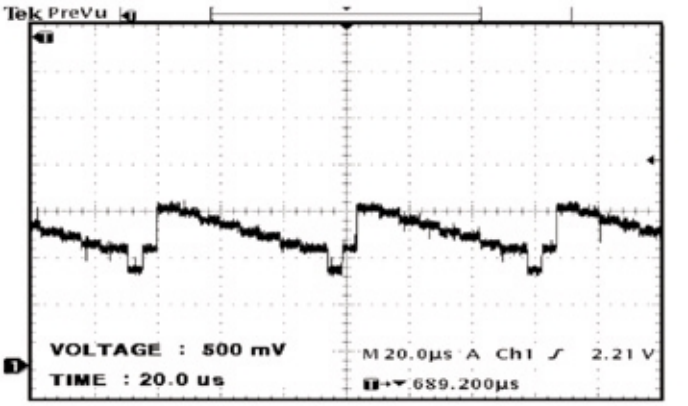
(1) IC and TP

(1) IC400(UPD64083)

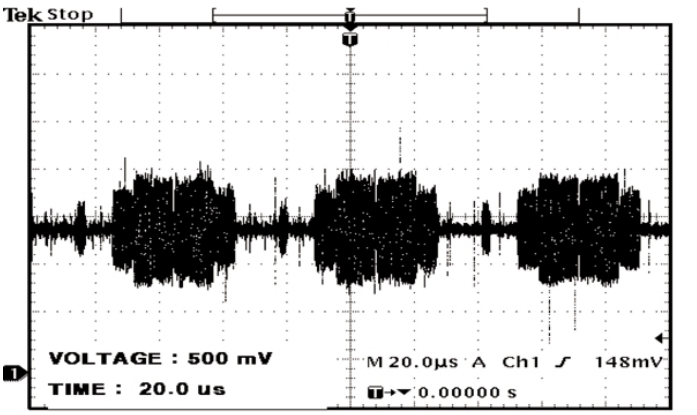
-Using 3D COMBFILTER to separate COMPOSITE signal to Brightness Signal(Y) and Color Signal(C)

*TP (Input : COLOR BAR PATTERN)

A. YCOMP : Brightness Signal(Y)



B. CCOMP : Color Signal (C)



(2) IC401 (SAA7118E)

-Receive NTSC, SECAM, PAL VIDEO by COMPOSITE(V) , S-VHS(Y.C) COMPONENT (Y Cb Cr) and process signal

*TP

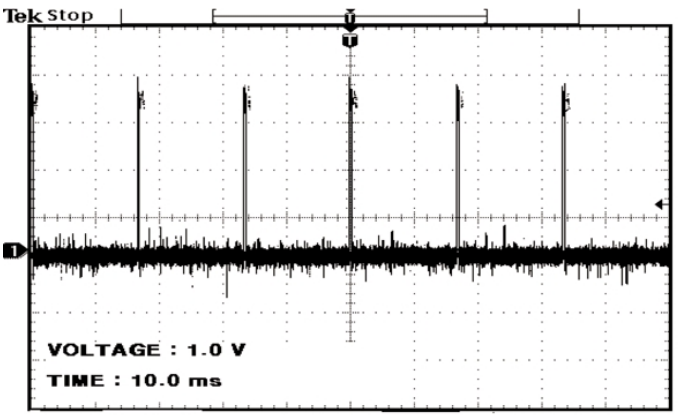
A. DECOE : CHIP ENABLE part. When signal process is done by IC401, DC 3.3V is measured.

(3) IC406(DPTV-MVS)

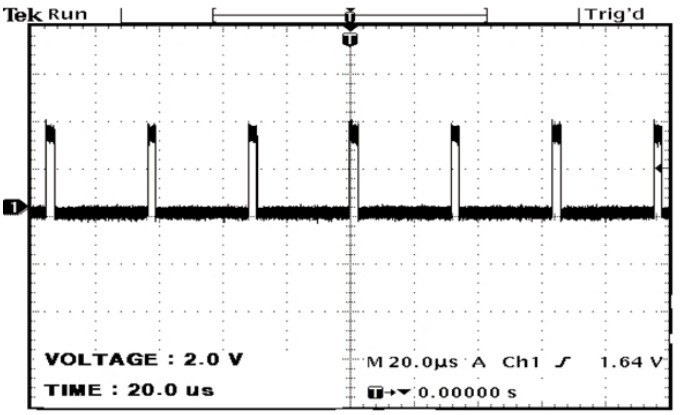
-A Scan Rate Converter which converts Interlace signal into Progressive signal

*TP

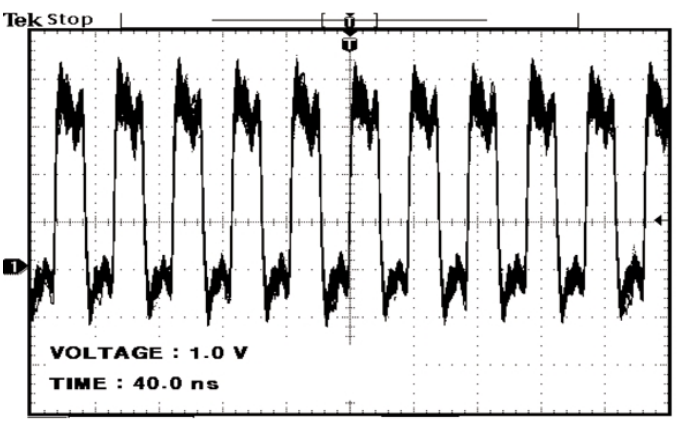
A. VVS : VERTICAL SYNC (output of DPTV-MVS)



B. VHS : HORIZONTAL SYNC (output of DPTV-MVS)



C. VCLK : CLOCK (output of DPTV-MVS)

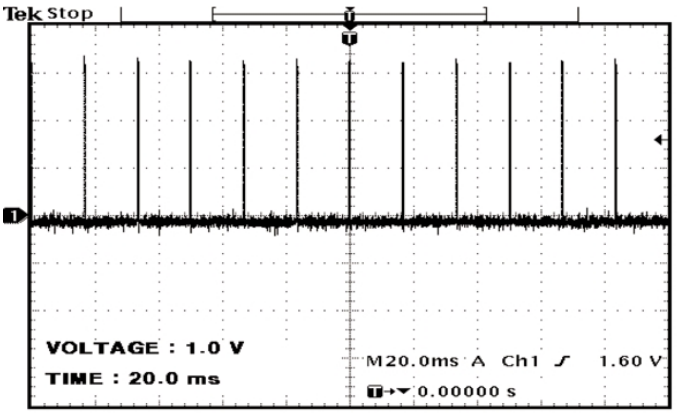


(4) IC500(CXA3516R)

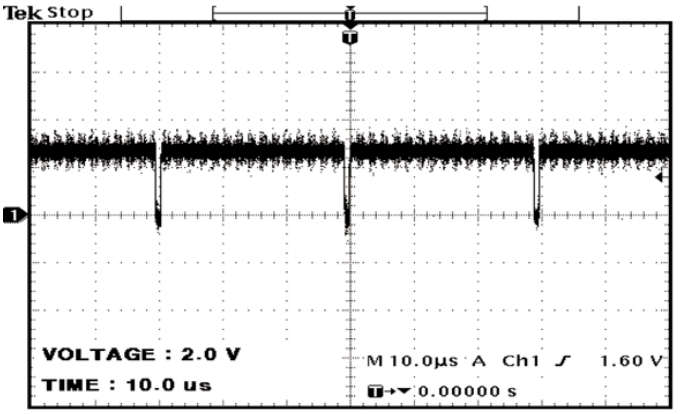
-3-channel 8-bit 165MSPS A/D converter which process PC , DTV signal

* TP

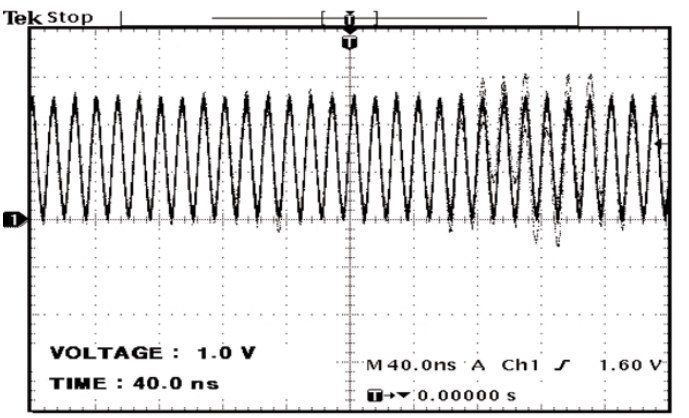
A. GCOAST : COAST CONTOL Signal for PLL (input of CXA3516)



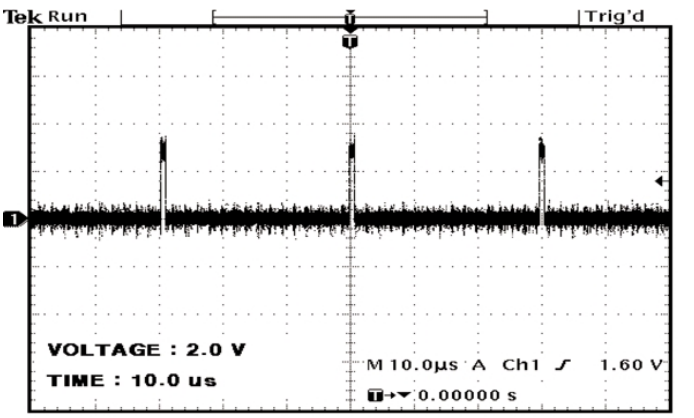
B .GHS : HORIZONTAL SYNC for GRAPHIC (output of CXA3516)



C. GCLK : CLOCK for GRAPHIC (output of CXA3516)



D. GFBK : SYNC for PLL

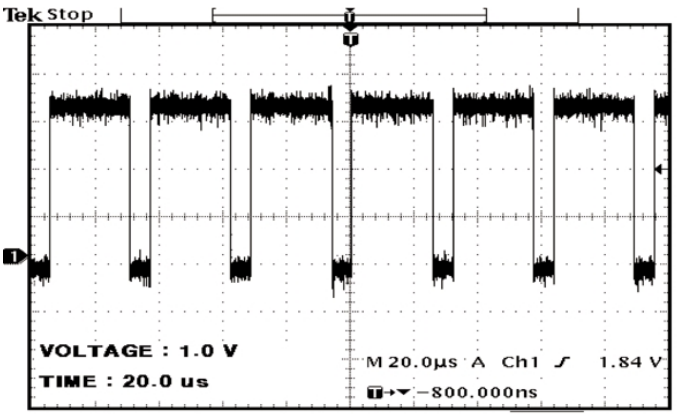


(5) IC600(PW171)

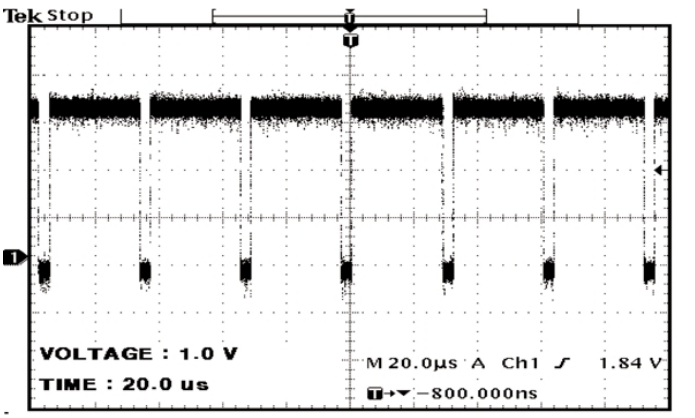
- Image processor IC

*TP

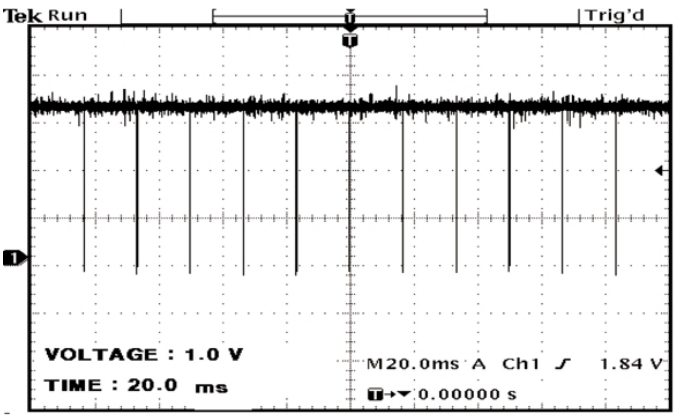
A. DEN : DATA ENABLE (output of PW171)



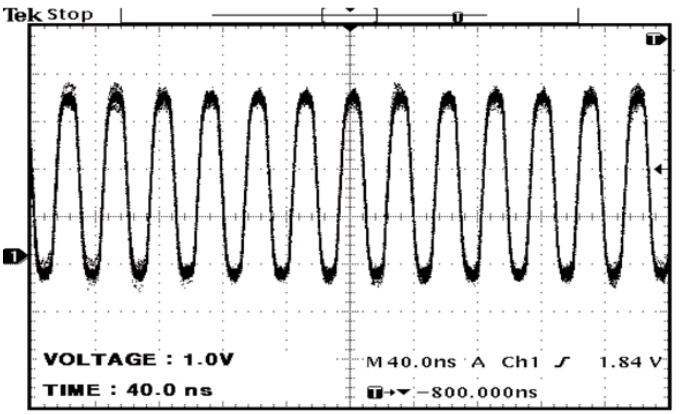
B. DHS : HORIZONTAL SYNC (output of PW171)



C.DVS : VERTICAL SYNC for DISPLAY (output of PW171)



D. DCLKB : CLOCK for DISPLAY (output of PW171)



4-1-3. JACK PCB

- Separate and process various VIDEO and AUDIO signal

(1) IC706 (VIDEO /SYNC SELECTOR)

- This chooses Y Cb/Pb Cr/Pr or RGB signal to output Y Cb/Pb Cr/Pr, to separate SYNC, and to perform SYNC COUNTER.

(2) IC704 (AUDIO/VIDEO SWITCH)

- The IC perform AUDIO or VIDEO SWITCHING

(3) IC715 (DIGITAL CONTROLLER)

- DVI CONTROLLER

(4) IC721 (INPUT SELECTOR SWITCH)

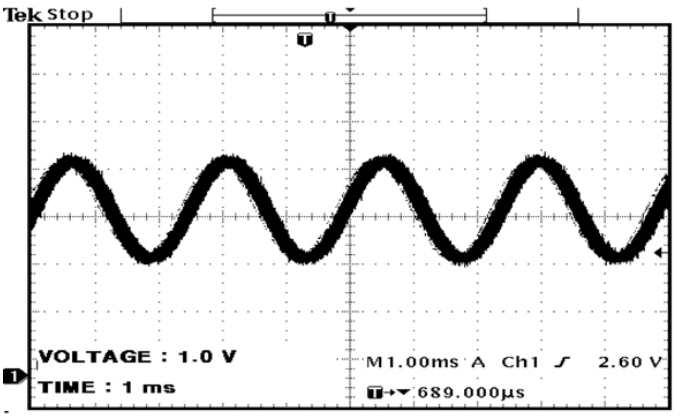
- SCART (RGB) SELECTOR SWITCH

(5) IC700 (MULTI STANDARD SOUND PROCDSSOR)

-AUDIO SINGNAL VOLUME control, EQUALIZER control

*TP

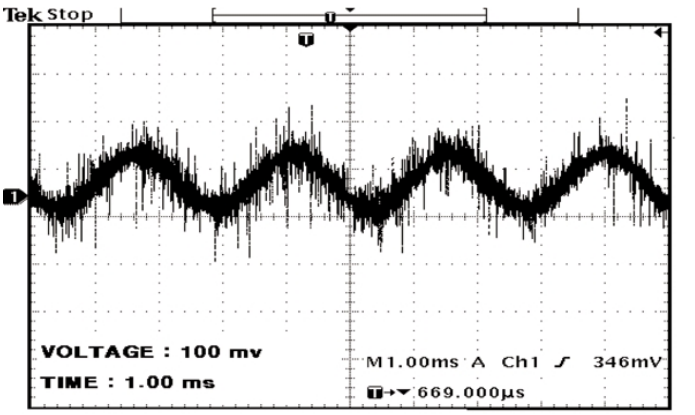
R_OUT(L_OUT) : AUDIO SIGNAL that goes into MSP3420 before AUDIO PROCESSING



(4) IC701 .IC700 (TDA 7480)

*TP

A. RIGHT(LEFT) :AMP input signal before 30dB amplification

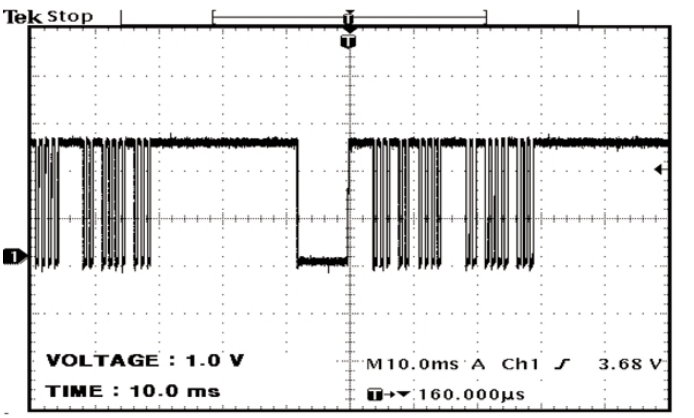


4-1-4.KEY PCB

- Input PCB using KEY

4-1-5.LED PCB

- PCB for REMOCON CONTROL



4-2. POWER PCB

<Input requirements>

◆ Nominal Input Voltage : AC100V to AC240V (Variation Range - AC85V to AC276V)
◆ Single-Phase full wave
◆ Regulation Method : Transistor Switching Method
◆ Input Frequency : 50~60Hz (Variation range 45Hz to 66Hz)
◆ Inrush Current : 50A zero-peak max at AC264V
◆ Output Voltage is as follows.

No.	Output Name	Nominal Voltage (V)	Variable range (V)	Voltage accuracy *1	Nominal current (A)	Load current range (A)	Ripple/Noise (mVp-p)*2
1	Vsus	190	180-195	±5V	1.3	0.1~1.3	1000/500
2	Vadd	60	50-80	±2V	1	0.1~1	250/500
3	V1	5.1	-	±5%	2.5	0.1~3	50/100
4	V3	17	-	±5%	1	0~1	50/100
	(SOUND)	-17	-	±5%	1	0~1	50/100
5	V4	5.0	-	±5%	1.5	0.1~1.5	50/100
6	V5	12	-	±5%	0.6	0~1	50/100
7	Vstb	5	-	±5%	1.5	0~1.5	100/100

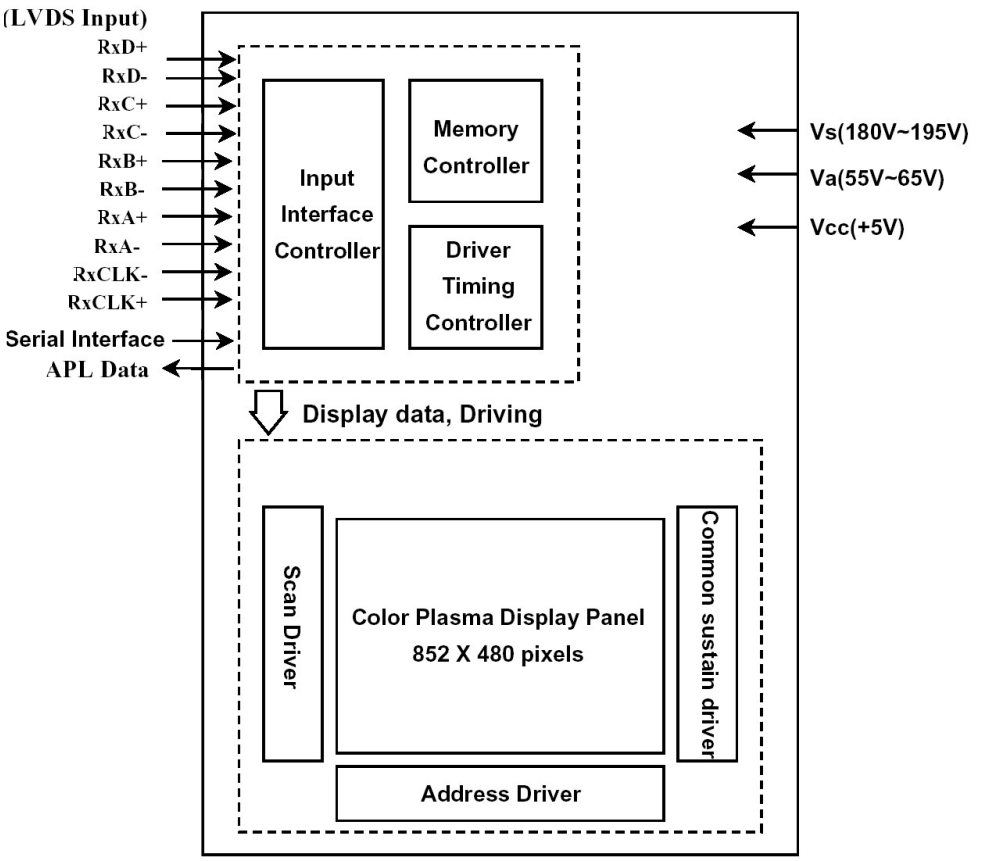
◆ Connector

Connector number		P2	P3	P6
Model name		GP390-10P-TS	1-1123723-8	GP390-04P-TS
Maker		LG Cable	AMP	LG Cable
The number of pins		10	8	4
Pin number	1	Vsus 190V	Vsus 190V	G
	2	Vsus 190V	Vsus 190V	G
	3	Vsus 190V	NC	V1 5.1V
	4	NC	G	V1 5.1V
	5	G	G	
	6	G	Vadd 60V	
	7	G	G	
	8	G	V1 5.1V	
	9	NC		
	10	NC		

Connector number		P4	P5	P7
Model name		YMW025-10R	YMW025-05R	YMW025-04R
Maker		YEONHO	YEONHO	YEONHO
The number of pins		10	5	4
Pin number	1	NC	POWER (ON/OFF)	V3 -17V
	2	NC	NC	G
	3	V5 12V	NC	G
	4	G	G	V3 17V
	5	G	Vstb	
	6	V4 5V		
	7	G		
	8	G		
	9	NC		
	10	NC		

* P2 is connected to P5 of Y-SUS PCB.
P3 is connected to P1 of Z-SUS PCB.
P6 is connected to P6 of Y-SUS PCB.
P4 is connected to PA4 of VIDEO PCB.
P5 is connected to PA5 of VIDEO PCB.
P7 is connected to PA6 of JACK PCB.

4-3. Basic Configuration



* Applied Voltage level is specified at the time, when full white pattern displayed on panel.

5. SERVICE MODE

5-1. Entering SERVICE MODE

Push “UP” → “MUTE” → “DISPLAY” → “MUTE” BUTTON of Remote Controller to enter SERVICE adjustment MODE.

5-2. Check initial data of Video PCB

(1) Check initial data of User Menu

1) Picture

- Mode : Normal
  - ◆ BRIGHTNESS : 35
  - ◆ CONTRAST : 47
  - ◆ COLOR : 32
  - ◆ TINT : 0 (CENTER) * Not displayed when PAL or SECAM input
  - ◆ SHARPNESS : 4
- Color Temp. : Normal

2) Sound

- Balance : 0 (CENTER)
- Spatial Effect : Off
- Sound Mode : Normal
  - ◆ 120 Hz : 0 (CENTER)
  - ◆ 500 Hz : 0 (CENTER)
  - ◆ 1.5 KHz : 0 (CENTER)
  - ◆ 5 KHz : 0 (CENTER)
  - ◆ 10 KHz : 0 (CENTER)

3) Screen Mode : Auto

4) Utility

- Background : Opaque
- Language : English (selected when Power ON by user just after manufacturing)
- ISM
  - ◆ Pixel Shift : Off
  - ◆ Low Bright : Off
  - ◆ Image Invert : Off

5) Input

- DSP-4222 : AV1(SCART)
- DSP-4220/24 : VIDEO1

(2) Check initial data of Service mode

1) PW 171

- Sub-Brightness : 28
- Sub-Contrast : 40
- Bias R : 64
- Bias G : 64
- Bias B : 64
- Gain R : 64

- Gain G : 64
- Gain B : 64

2) SAA 7118
- Sub BRT : 128
- Sub CONT : 50
- Sub CLR : 55
- Sub TINT : 0
- Sub SRP : 10

3) DPTV
- Sub BRT : 61
- Sub CONT : 16
- 50 : ON

4) CXA 3516
- Sub CONT : 58
- Cb OFFSET : 39
- Cr OFFSET : 37
- HYS : 3
- THRSLD : 14

5) MSP34X0
- PRESCALE : 22

6) MISC
- AT PWR : OFF
- JACK : Scart(SKY)
- PXL SFT : OFF

7) PANEL
- ISM : OFF
- BWINV : OFF
- GAMMA : 2.1
- BRIGHT : 100 %
- SCROLL : OFF
- P SAVE : 75 %
- MOVING : AV
- STILL : PC

5-3. Description of SERVICE MODE Items

1) PW171 : It is a Image processor and used to adjust White balance.
[Note] This article is for adjustment after replacement of VIDEO PCB. These values may vary from set to set. Therefore if these values are recorded before replacing VIDEO PCB, you do not need to adjust WHITE BALANCE additionally. The setup can be done using the recorded values.

(1) SUB BRT : For BRIGHTNESS adjustment (fixed)
(2) SUB CONT : For CONTRAST adjustment (fixed)
(3) BIAS R : For R BIAS adjustment (Changeable)
(4) BIAS G : For G BIAS adjustment (Changeable)
(5) BIAS B : For B BIAS adjustment (fixed)
(6) GAIN R : For R GAIN adjustment (Changeable)
(7) GAIN G : For G GAIN adjustment (Changeable)
(8) GAIN B : For B GAIN adjustment (fixed)

2) SAA7118 : It is a VIDEO DECODER and used to adjust a picture quality for VIDEO/DVD(480i).
[Note] This article is not for adjustment after replacement of VIDEO PCB. Therefore do not change initial values.

(1) SUB BRT : For BRIGHTNESS adjustment (VIDEO/DVD) (fixed)
(2) SUB CONT : For CONTRAST adjustment (VIDEO/DVD) (fixed)
(3) SUB CLR : For COLOR adjustment (VIDEO) (fixed)
(4) SUB TNT : For TINT adjustment (VIDEO) (fixed)
(5) SUB SRP : For SHARPNESS adjustment (VIDEO) (fixed)

3) DPTV : Be used to adjust DEINTERLACE performance.
[Note] This article is not for adjustment after replacement of VIDEO PCB. Therefore do not change initial values.

(1) SUB BRT : For BRIGHTNESS adjustment (VIDEO/DVD) (fixed)
(2) SUB CONT : For CONTRAST adjustment (VIDEO/DVD) (fixed)
(3) 50P : ON for 50Hz / OFF for 60Hz (fixed)

4) CXA3516 : It is a DTV/PC PROCESSOR and used to adjust a picture quality for DTV/PC.
[Note] This article is not for adjustment after replacement of VIDEO PCB. Therefore do not change initial values.

(1) SUB CONT : For CONTRAST adjustment (fixed)
(2) Cb OFFSET : For Cb Offset adjustment (fixed)
(3) Cr OFFSET : For Cr Offset adjustment (fixed)
(4) HYS : For Sync hysteresis adjustment (fixed)
(5) THR SLP : For Sync threshold adjustment (fixed)

5) MSP34X0
[Note] This article is not for adjustment after replacement of VIDEO PCB. Therefore do not change initial values.

(1) PRESCLE : Be used to adjust a Audio prescale.

6) MISC

(1) TST PTRN AT : Cycled patterns from R→G→B→WH every 1 minute automatically.

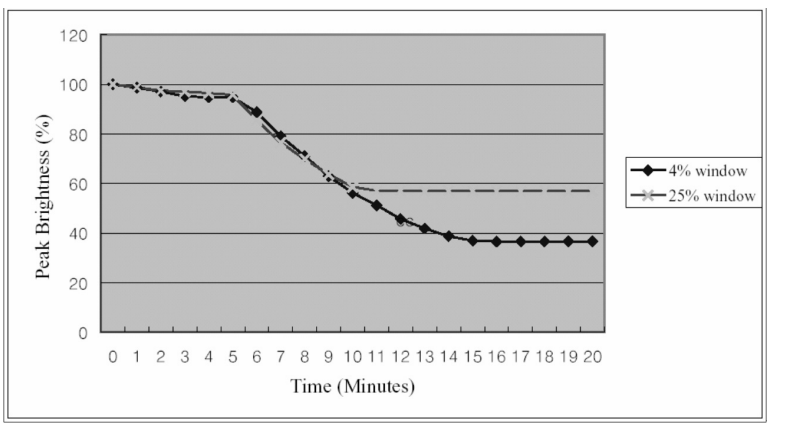
(2) TST PTRN MA : Cycled patterns from BK→WH→R→G→B by pressing volume up key
(3) AT PWR : ON - Condition where turning AC power on, automatically turns the SET on.
OFF - Condition where turning AC power on makes the Set STAND BY, and POWER of Remote-controller on turns the set on from STAND BY state.
(4) JACK : Set up depending on input MODE of JACK BOARD
- SCART(SKY) : MULTI + DVI + SCART (DSP-4222LVS))
- MULTI : Used by DSP-4280 series, Multimedia monitor.
- MONITOR : Used by DSP-4282 series, PC only monitor.
- MONITOR+ : Used by DSP-4282 series with DSP-JU20 attached, PC only monitor with External board connection.
- VIDEO : Video only monitor

[Note] Wrong setup causes displaying problem. So you must be careful when SETTING.
(5) PXL SFT : To choose a picture auto shift mode to protect a PDP(Ghost fault) ON - Moving screen up, down left and right by some Pixels every 20 seconds.
OFF - Fixing PIXEL position. No movement on screen.
[Note] PIXEL SHIFT function is solution to characteristic phenomenon of PDP, so-called "Image Sticking" problem. Leave this function ON, when displaying many fixed screen like PC screen. When this function is ON the screen will move a little for every fixed interval but a human eye can not recognize it well.

7) INFOR
(1) VER : MICOM VERSION
(year 4 digits, month 2 digits, date 2 digits and time 4 digits : 200309222030)

8) RESET
(1) EDID SET
[Note] Be used to set to write EDID data (After setting it is changed to "EDID DONE"). Before setting EDID, you have to short jumpers of JP710. After setting, you must remove jumpers, and then, turn off and on main power. If "EDID WRITING ERROR" is displayed, Try again. But, in DEUK, you don't have to set EDID set (After removing jumpers, EDID DONE is changed to EDID SET).
(2) LEVEL 1 : Be used to initialise all of the data including adjusted figures for W/B.
(3) LEVEL 2 : Be used to initialise all of the data except adjusted figures for W/B
(4) FACTORY : For User menu initialisation, is actaviated by choosing a language on AC ON mode. (Menu Display, VOL, OSD Background and Input mode (VIDEO 1) initialisation). (Should be selected on being dispatched)

9) PANEL
(1) ISM : Used to minimize Image Sticking (ON/OFF).
ON : When Still images or regular patterns have been displayed on screen for some times, the luminance of screen is going to decrease as below. (But, only when pattern area is over 50% and it is lasting over 5 minutes)



(2) BWINV : Used to minimize Image Sticking (ON/OFF)

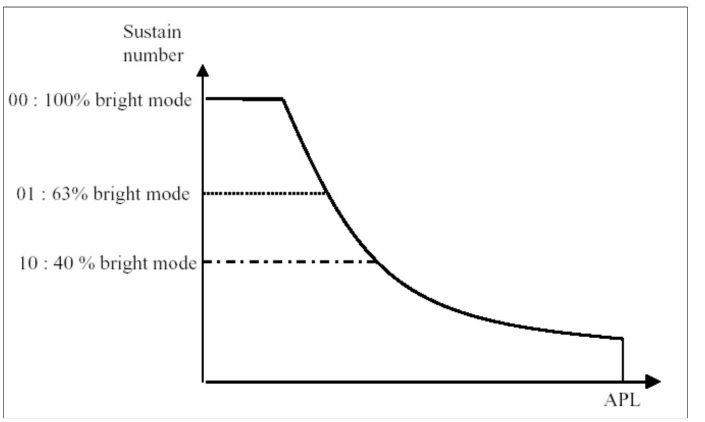
ON : Inverting the original images.(in Digital image data, '0' → '1', '1' → '0')

* If Still images have been displayed for some periods, this function can minimize Image sticking, by displaying it on BWINV mode for some times.

Table	Gamma Contents
1	γ=2.2
2	γ=1
3	γ=2.1 (default)
4	γ=2.4

(3) GAMMA : can choose one in 4 gamma tables

(4) BRIGHT : Adjusting Peak Luminance
1. 100% : Full Peak Luminance
2. 63% : 63% of Peak luminance
3. 40% : 40% of Peak luminance
(* See the graph below)
4. APL: Average Picture Level



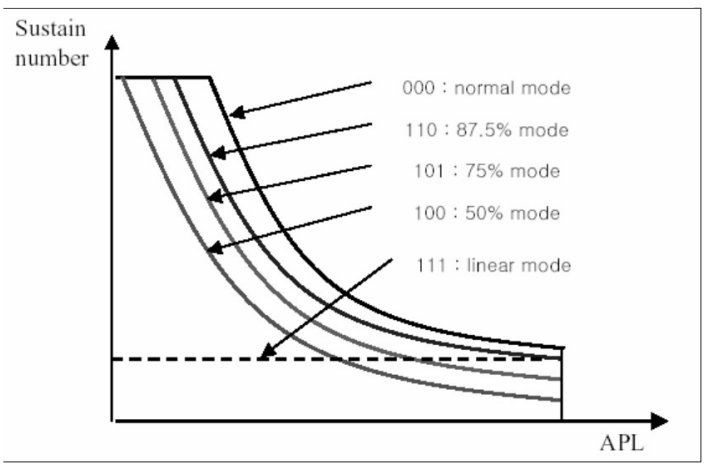
(5) SCROLL : Minimizing Image Sticking (ON/OFF) by Shifting whole screen BRIGHT : Adjusting Peak Luminance. (same with PXL SFT function in 6.MISC)
ON : This function moves1~8 pixel with a regular rule, up, down, left, right every 10 sec

(6) BRIGHT : Adjusting Peak Luminance

(7) P SAVE : Controlling power consumption by changing Luminance level of whole screen.
1. 100% : Peak Luminance & Maximum Power Consumption mode
2. 87% : 87% mode
3. 75% : 75% mode
4. 50% : 50% mode
5. linear : linear mode(Constant luminance without regard to APL)

* WARNING!! The choice of these modes can cause difference of Power Consumption.

* See the below



(8) MOVING : Setting display mode of Input channel except PC input.

(9) STILL : Setting display mode for PC input.

6-1. Adjusting WHITE BALANCE

1) Apply 5 Step Gray Scale pattern to Video input terminal
(MIK 7253S PATTERN NO.9)

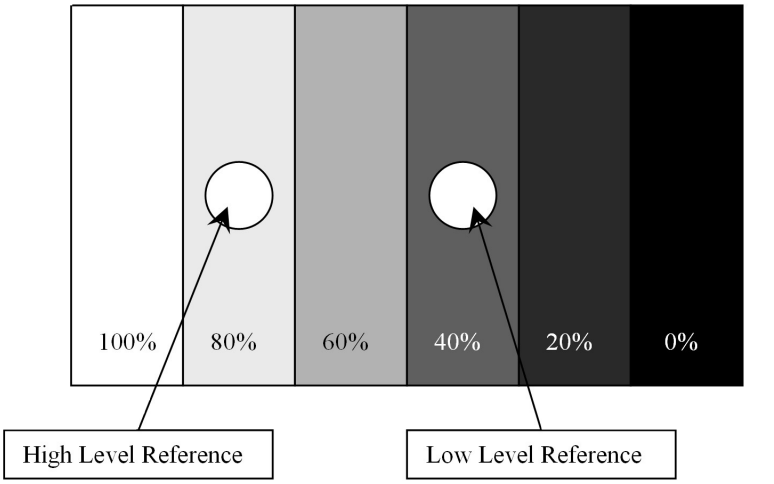


Fig. 2 5 Step Gray Scale Pattern

2) Check initial data of User Menu (refer to 5-2)
3) To enter Service mode, press button " up > mute > recall > mute " on the remote controller and select PW171, then check initial data of Service mode(refer to 5-2).
4) Attach a sensor of White Balance Meter(CA-100) to 80% of white level on the screen.
5) Adjust White Balance by varying Gain of R,G,

* Gain of R, G, should be adjusted to DP+ 10 ,if beyond these then that is a specification fault
* Coordinate of Color is x=0.270 + 0.005, y=0.300 + 0.005 and the Color Temperature is over 10,000-degree K.

6) Attach a sensor of White Balance Meter to 40% of white level on the screen
7) Adjust White Balance by varying the values of R,G,

* Values of R,G, should be adjusted to DP + 5 ,if beyond these then that is a specification fault
* Coordinate of Color is x=0.270 + 0.005, y=0.300 + 0.005.

8) Repeat No 4) to No 7) until getting that Coordinate of Color is x=0.270, y=0.300, and then adjust Sub Contrast to over 100 Cd/m square after attaching a sensor of White Balance Meter to 100% of white level on the screen.
9) To exit from Service mode, press Menu button on the remote controller.

6-2. POWER ADJUSTMENTS

* Video pattern condition : 100 IRE Full White Pattern
* POWER PCB Adjustments mean that you should set the following 2-type power voltages to the values which were already adjusted by PDP module (LG Module) maker. Therefore, if there are some problems in picture after adjusting, you should classify that PDP module as a fault and contact to PDP module maker.

1. Vsus (SUSTAIN Voltage) : Discharge Sustain Voltage

◆ Measurement equipment : Digital Volt Meter (DC Volt mode)
◆ Adjusting TP : TP204 (See Fig. 4)
◆ Adjusting Location : RV203 (See Fig. 4)
◆ Optimum Adjusting Voltage : Voltage which is written in Label which is at upper right side of PDP Module. (Typical Voltage : 190 V - Fig. 3)

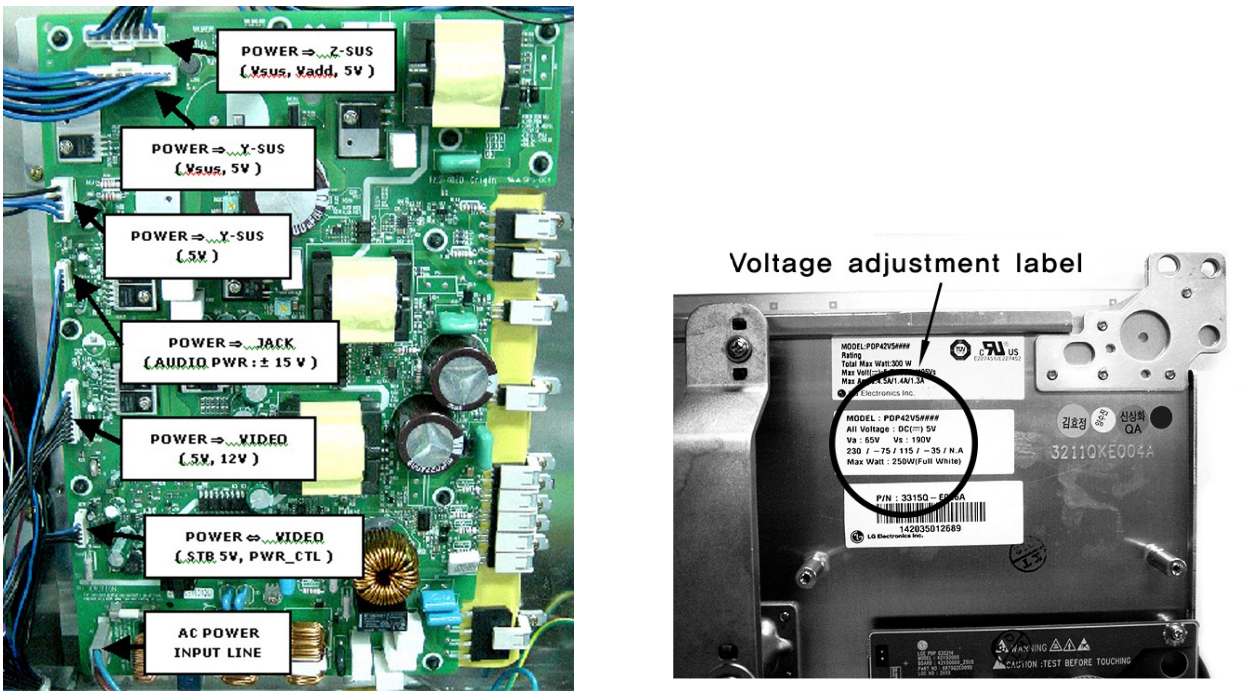


Fig. 3 Power Connection and Voltage Adjustment Label

2. Vadd (ADDRESS Voltage) : DATA Input Voltage
   - ◆ Measurement equipment : Digital Volt Meter (DC Volt mode)
   - ◆ Adjusting TP : TP206 (See Fig. 4)
   - ◆ Adjusting Location : RV204 (See Fig. 4)
   - ◆ Optimum Adjusting Voltage : Voltage which is written in Label which is at upper right side of PDP Module. (Typical Voltage : 65 V - Fig. 3)

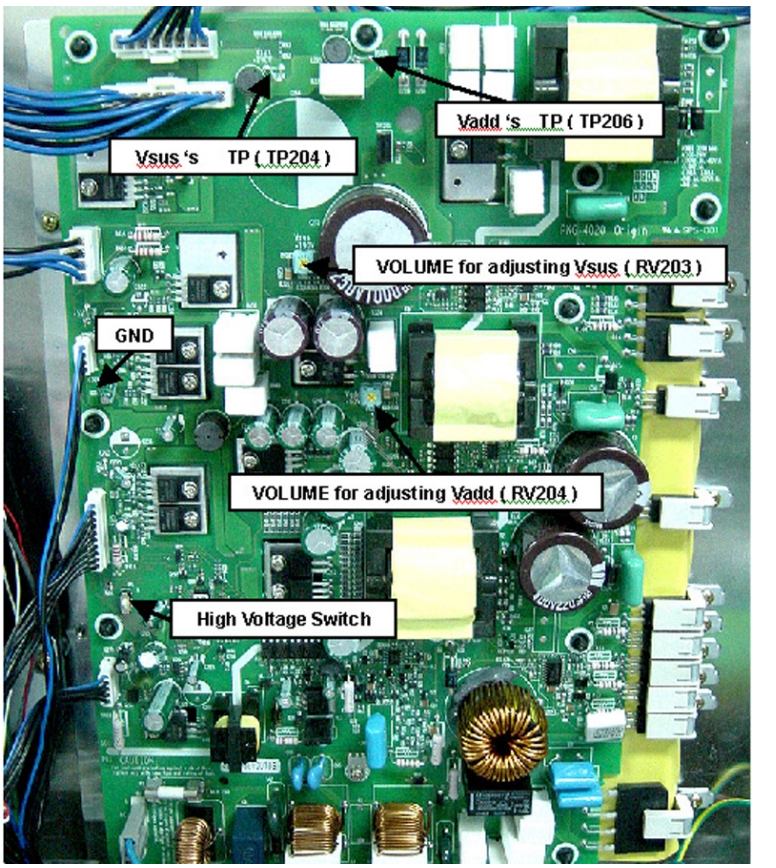


Fig. 4 Power Adjustment Points

7.SOFTWARE UPGRADE Method

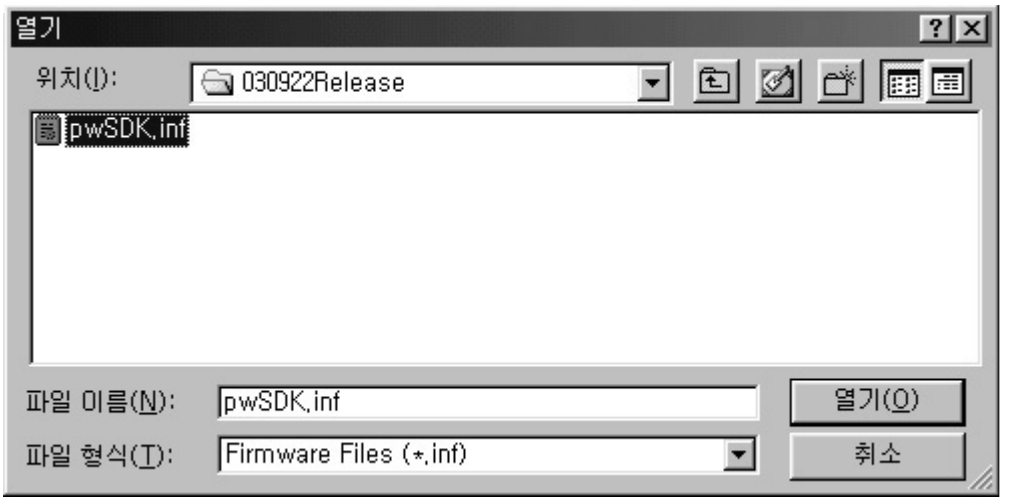
1. Connect the JACK PCB to the Video PCB.
2. Connect 9 PIN serial cable to the serial port of the computer.
3. Connect the opposite end of the serial cable to RS-232C port of Jack PCB.
4. Run Flashupgrader.exe in PC and then push "Next(N) >" button.

Pixelworks ImageProcessor Firmware Upgrade Wizard
pixelworks
This wizard will upgrade the firmware in devices that contain the Pixelworks ImageProcessor. Please contact technical support if you experience problems while using this wizard.
Before upgrading the device, you will be prompted to select the firmware file you would like to install.
To select the firmware file, click Next.
About
© 1998-2001 Pixelworks.
< 뒤로(B)
다음(N) >
취소

5. Select current Upgrade file
   - Click "Browse" button to select the file you want to upgrade.

Pixelworks ImageProcessor Firmware Upgrade Wizard
Select the new firmware file that you would like to install in your hardware.
Enter path and name of firmware file.
C:₩pwsdk₩embedded₩bin₩pwSDK.inf
Browse
Note: Check with Pixelworks to verify that you have the latest version of the firmware available.
Verify Only
To continue, click Next.
< 뒤로(B)
다음(N) >
취소

- Select the file (pwSDK.inf) you want to upgrade and Push "Open(O) >" button.

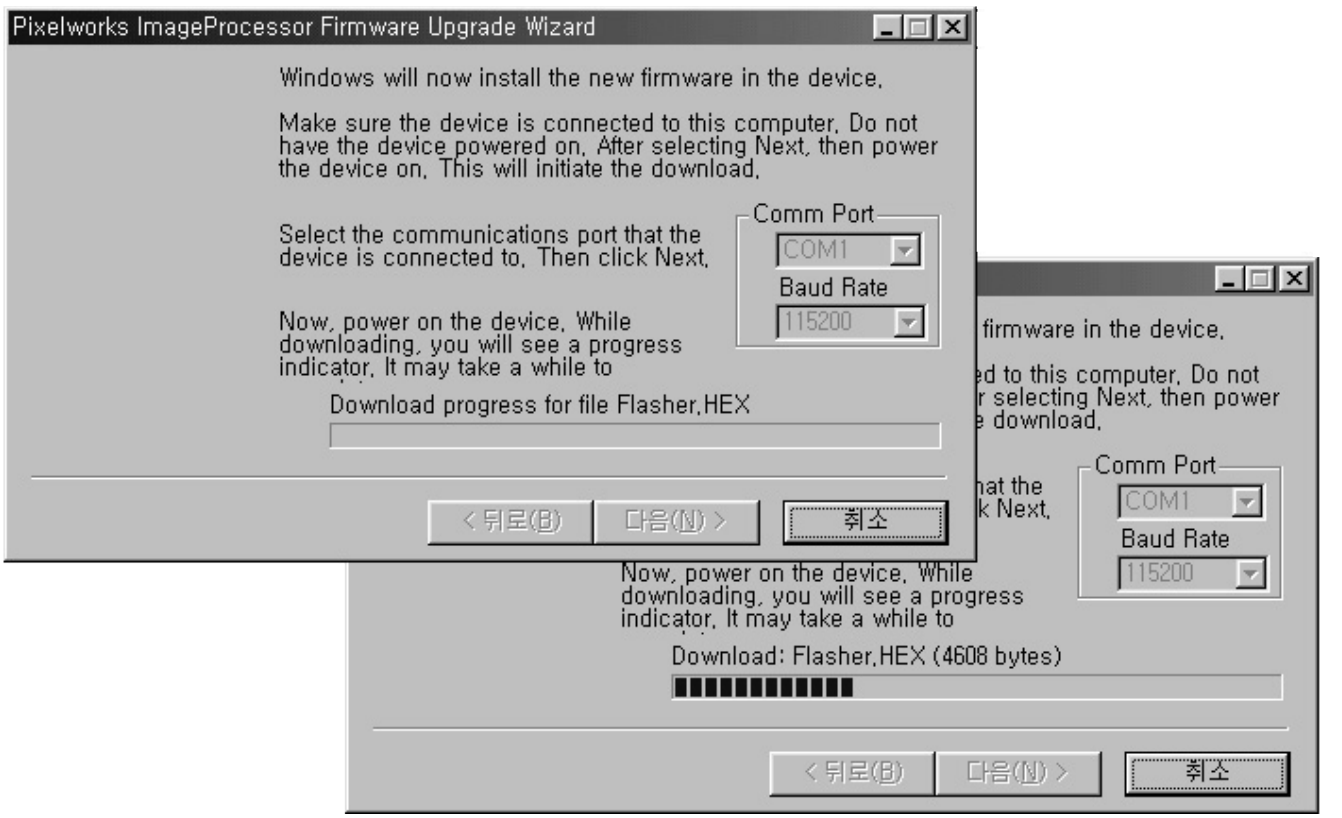


6. Select as above and push "Next(N) >" button.

7. Select Comm Port and Baud Rate and push "Next(N) >" button.

Pixelworks ImageProcessor Firmware Upgrade Wizard
Windows will now install the new firmware in the device.
Make sure the device is connected to this computer. Do not have the device powered on. After selecting Next, then power the device on. This will initiate the download.
Select the communications port that the device is connected to. Then click Next.
Comm Port
COM1
Baud Rate
115200
< 뒤로(B)
다음(N) >
취소

8. Upgrade process will be displayed. Turn on the ac power and then upgrade program will initiate the download.


Pixelworks ImageProcessor Firmware Upgrade Wizard
Windows will now install the new firmware in the device.
Make sure the device is connected to this computer. Do not have the device powered on. After selecting Next, then power the device on. This will initiate the download.
Select the communications port that the device is connected to. Then click Next.
Comm Port
COM1
Baud Rate
115200
Now, power on the device. While downloading, you will see a progress indicator. It may take a while to
Download progress for file Flasher.HEX
< 뒤로(B)
다음(N) >
취소
Download: Flasher.HEX (4608 bytes)

9. When all files upgrade are complete, a window (below) will be opened. Push "Finish" button to complete the process.

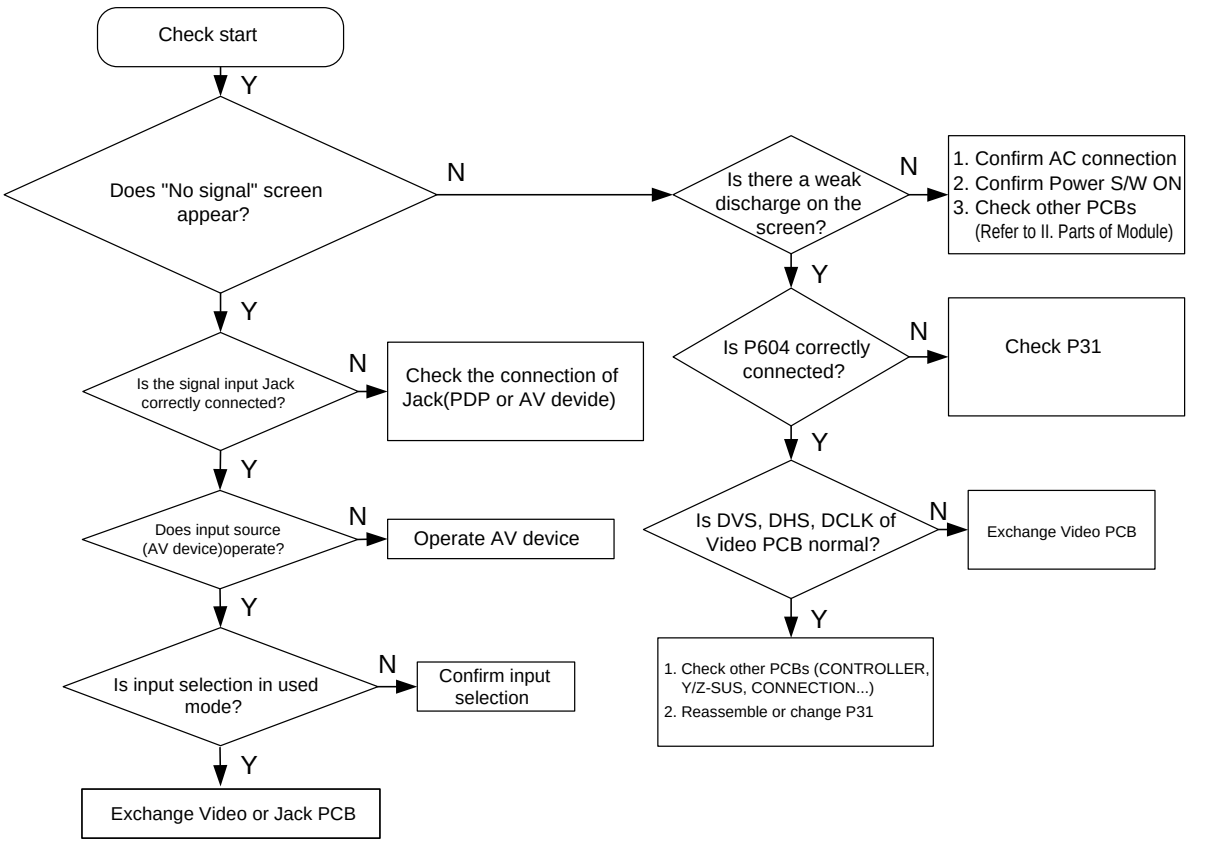
Pixelworks ImageProcessor Firmware Upgrade Wizard
Windows has successfully installed the new firmware in the device.
To complete the operation click Finish.
< 뒤로(B)
마침
취소

8. Main PCB Trouble Diagnosis

[NOTE] See "II. PARTS of MODULE" of this service manual for the trouble diagnosises concerned to MODULE with exception of VIDEO, JACK and POWER parts.

8-1. VIDEO & JACK PCB Trouble Diagnosis

1. Common checking process when "No signal" or "No raster"



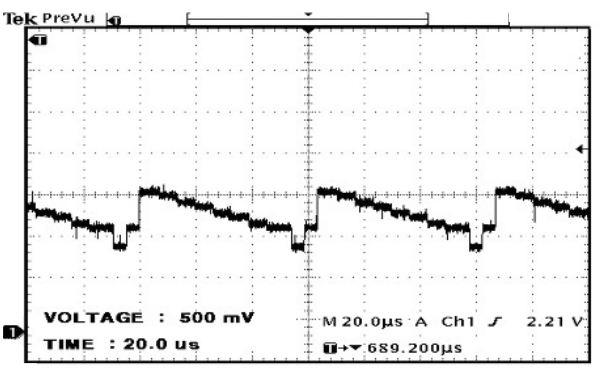
2. When No VIDEO (SCART (AV1, AV2), COMPOSITE (AV3), S-VIDEO (AV3) , Y Cb Cr) signal on screen

(1) Input PC or DTV signal and see if PC or DTV signals shown on screen.

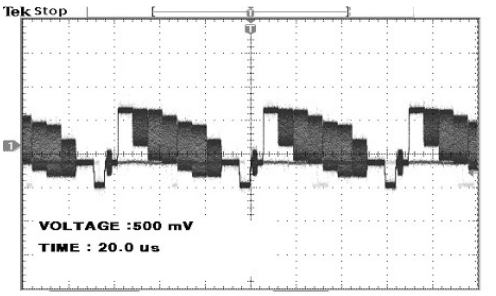
➞ If no signal, check TP DCLK, DHS and DVS signal.

➞ If DCLK, DHS and DVS signal do not appear, VIDEO PCB has a trouble.

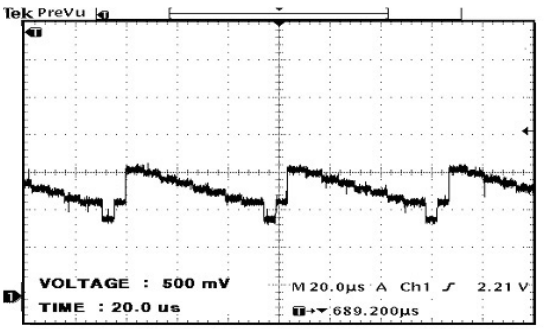
(2) When Y Cb Cr input : Check 16th pin of P502.



COMPOSITE Input : Check TP Vin.



S- VHS input : Check 24th pin of P502 (when COLOR BAR PATTERN).



➞ If above signal do not appear, JACK PCB has a trouble.

(3) TP DECOE Check

➞ If DECOE signal do not appear, JACK PCB has a trouble.
(cf. When COMPOSITE NTSC 3.58MHz, check TP COMB. CCOMB as well)

(4) Check TP VVS, VHS, VCLK and VPEN1

➞ If VVS, VHS, VCLK and VPEN1 signal do not appear, JACK PCB has a trouble.

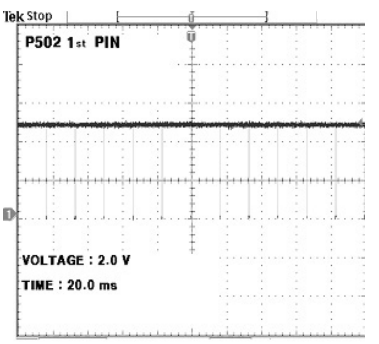
3. When DTV (1080i, 720P, 480P) signal do not appear on screen

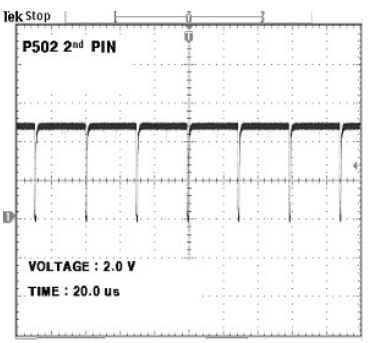
(1) Input PC or VIDEO signal and see if PC or VIDEO signals shown on screen.

➞ If no signal, check TP DCLKB, DHS and DVS.

➞ If DCLKB, DHS and DVS signal do not appear, VIDEO PCB has a trouble.

(2) Check P502's 1st PIN(V SYNC) , 2nd PIN(H SYNC) check-<when 1080i >





➞ If above signals do not appear, JACK PCB has a trouble.

(3) Check TP GHS, GVS and GCLK.

➞ If GHS, GVS and GCLK signal do not appear, JACK PCB has a trouble.

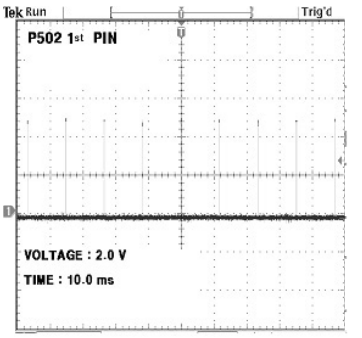
4. When PC signal do not appear on screen

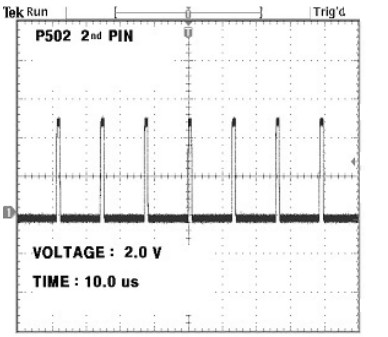
(1) Input DTV or VIDEO signal and see if DTV or VIDEO signals shown on screen.

➞ If no signal, check TP DCLKB, DHS and DVS.

➞ If DCLKB, DHS and DVS signal do not appear, JACK PCB has a trouble.

(2) Check 1st PIN (V SYNC), 2nd PIN (H SYNC) of P502 (when 800 ×600).



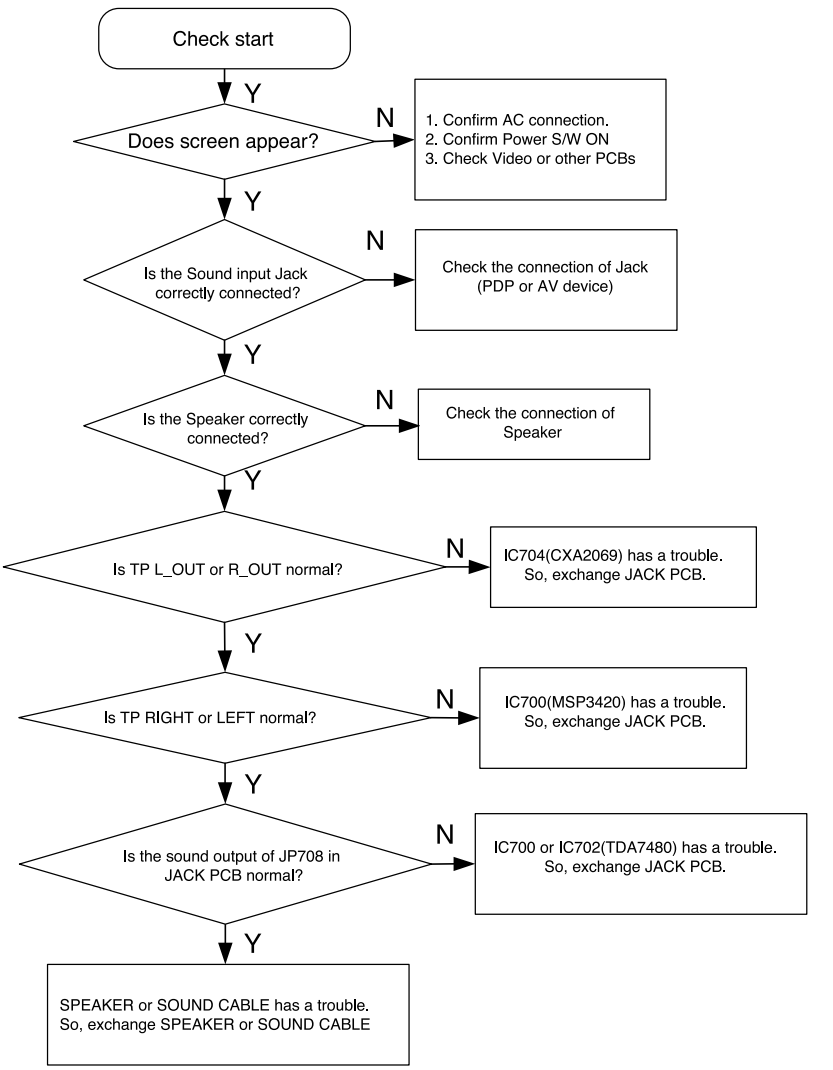


➞ If above signal do not appear, JACK PCB has a trouble.

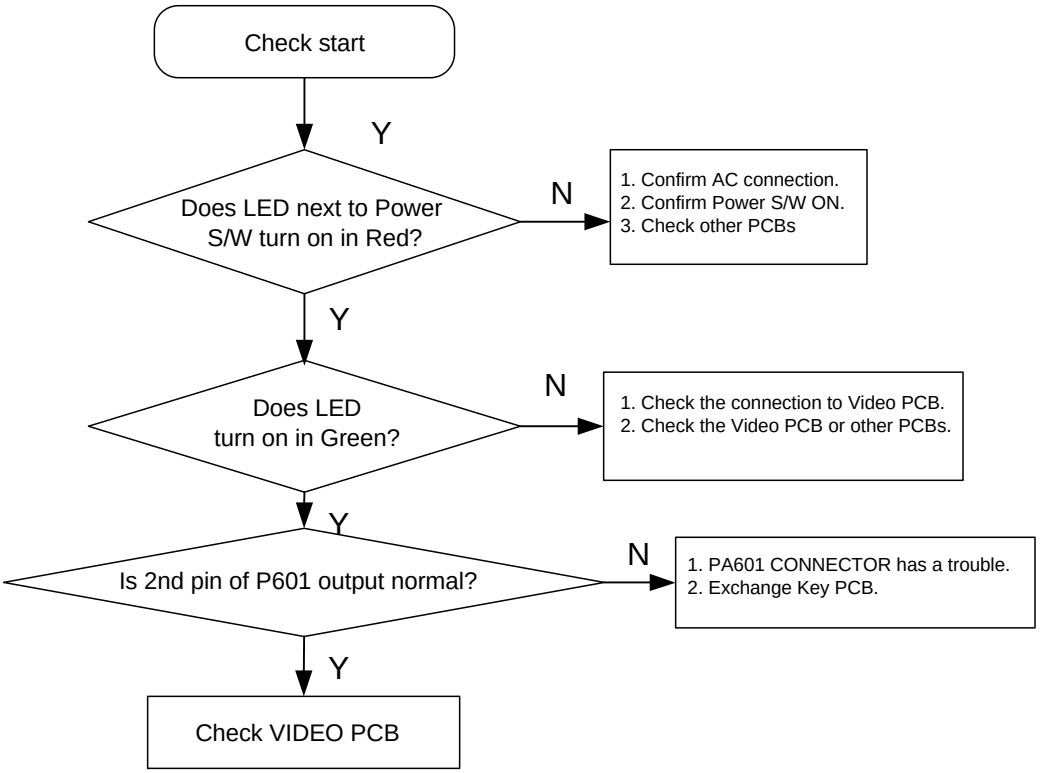
(3) Check TP GHS, GVS and GCLK.

➞ If GHS, GVS and GCLK signal do not appear, JACK PCB has a trouble.

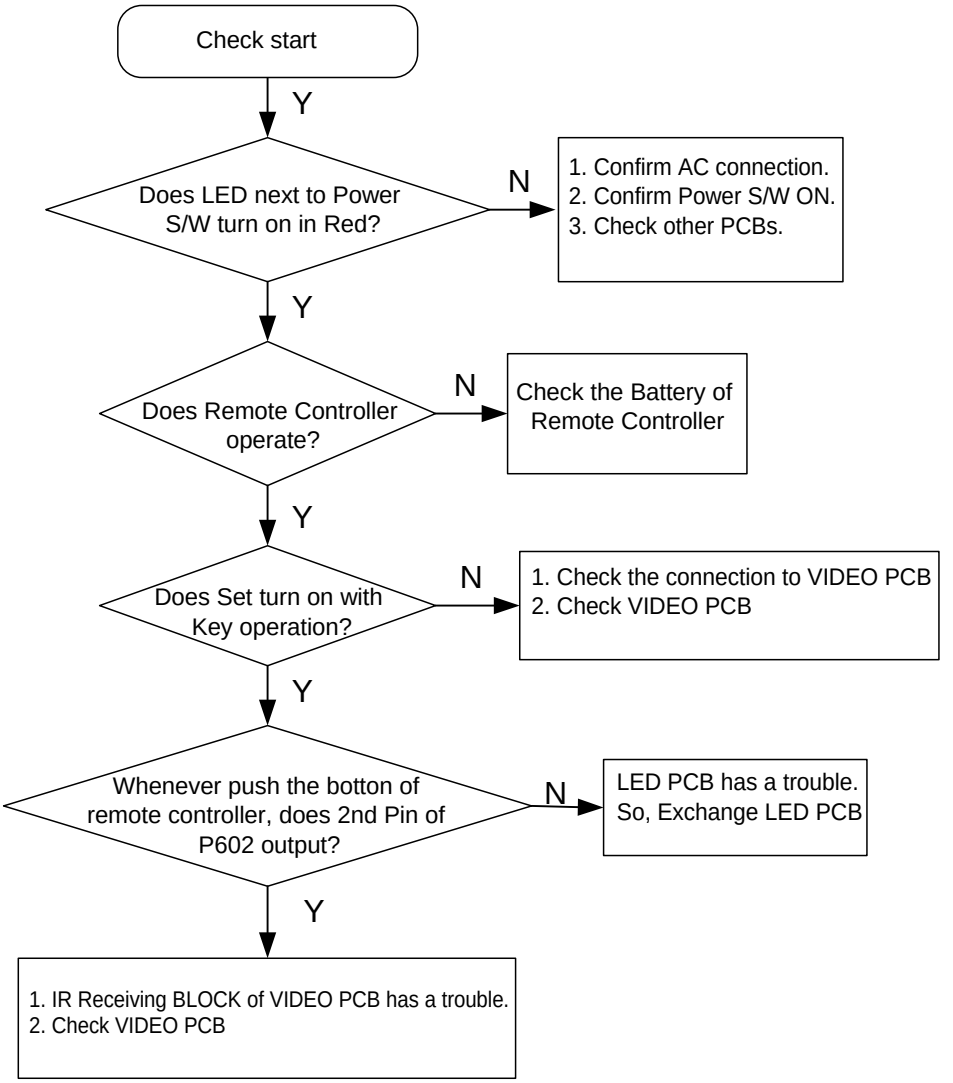
5. When No Sound


Check start
Does screen appear?
Y
N
1. Confirm AC connection.
2. Confirm Power S/W ON
3. Check Video or other PCBs
Is the Sound input Jack correctly connected?
Check the connection of Jack (PDP or AV device)
Is the Speaker correctly connected?
Check the connection of Speaker
Is TP L_OUT or R_OUT normal?
IC704(CXA2069) has a trouble. So, exchange JACK PCB.
Is TP RIGHT or LEFT normal?
IC700(MSP3420) has a trouble. So, exchange JACK PCB.
Is the sound output of JP708 in JACK PCB normal?
IC700 or IC702(TDA7480) has a trouble. So, exchange JACK PCB.
SPEAKER or SOUND CABLE has a trouble. So, exchange SPEAKER or SOUND CABLE

6. When Key does not operate



7. When Remote Controller does not operate


Check start
Y
Does LED next to Power S/W turn on in Red?
N
1. Confirm AC connection.
2. Confirm Power S/W ON.
3. Check other PCBs.
Y
Does Remote Controller operate?
N
Check the Battery of Remote Controller
Y
Does Set turn on with Key operation?
N
1. Check the connection to VIDEO PCB
2. Check VIDEO PCB
Y
Whenever push the botton of remote controller, does 2nd Pin of P602 output?
N
LED PCB has a trouble. So, Exchange LED PCB
Y
1. IR Receiving BLOCK of VIDEO PCB has a trouble.
2. Check VIDEO PCB

8-2. POWER PCB Trouble Diagnosis

◆ Although Z-SUS / Y-SUS / SCAN / DATA COF (refer to II. PARTS of MODULE) are checked, but still the set does not operate, and then check if Trouble Symptoms of the following Power PCB appear.

→ After unplugging Power Connectors of Z-SUS(P1) / Y-SUS(P5, P6) PCB and checking remaining voltage, there still exist several tens of remaining voltage.

→ When output condition of Power Module is set to low-voltage, output voltage table lists 3~7 are NOT normal. Or when set to high-voltage, output voltage table list 1~2 are NOT normal. (Refer to 4-2)

→ When output condition of Power Module is set to low-voltage, output voltage table lists 3~7 are normal. But when set to high-voltage, output voltage table list 1~2 are NOT normal. (Refer to 4-2)

→ After turn on the PDP set with Remote Controller, when output condition of Power Module is set to high-voltage, the LED turn "Green" but the "Power Shut Down" happens after 2~3 seconds.

◆ If high voltage (Vsus, Vadd) measured from Power PCB is different from that of optimum adjusting voltage label, re-adjust the voltages referring to "I. 6-2. POWER Adjustments"

9. TROUBLE SHOOTING

[NOTE] See "II. PARTS of MODULE" of this service manual for trouble shooting concerned to MODULE with exception of VIDEO, JACK and POWER parts.

9-1. Facts you must know at trouble diagnosis or repairing

(1) The trouble diagnosis and repairing of set means "Module Exchange". In other words, find out which PCB modules are not working and replace them with normal PCB modules. Do not need to fix broken PCB modules in themselves.

(2) This TROUBLE SHOOTING list only contains representative and simple PCB trouble diagnosis and Module Exchange method. Therefore, if you find Sets that are difficult to diagnose or to repair, contact Daewoo Electronics.

(3) Basic TROUBLE SHOOTING procedure Check Trouble Symptoms →Detach BACK COVER → Trouble Diagnosis →Replace broken PCB module →Adjust new PCB module (when replacing Z-SUS, Y-SUS, POWER, VIDEO PCB, need Adjusting Procedure. Refer to I. 6. Adjusting Method and II. 3. Adjustments) → HEATRUN (for at least 30 minutes, input TEST PATTERN FULL WHITE), FUNCTION CHECK → Repair Complete.

(4) Keep broken PCB modules separately for replacing with new PCB modules.

(5) Required equipments for trouble diagnosis
- DIGITAL MULTIMETER (User Mode : measure DC VOLTAGE, measure DIODE VOLTAGE, SHORT-OPEN TEST)
- Screwdriver (or electric screwdriver), plastic adjusting tool

(6) Each BLOCK operation was explained including DIGITAL OSCILLOSCOPE signal, but this is reference only and applying them for repair is not necessary. (After additional education, DIGITAL OSCILLOSCOPE could be used)

(7) Before assemble/disassemble PCBs, check to see if AC Switch is "OFF".

(8) After replacing Z-SUS, Y-SUS, POWER, VIDEO PCB, the PCB needs extra adjustment. (Refer to I. 6. Adjusting Method and II. 3. Adjustments)

(9) After the set is repaired, leave BACK COVER open for followings. Do HEATRUN for at least 30 minutes by inputting TEST PATTERN of SERVICE MODE (Refer to Service Manual I.5. Service Mode) FULL WHITE. Check the screen conditions and basic functions (remote control operation etc.).

(10) After BACK COVER is closed, redo HEATRUN for at least one hour by inputting FULL WHITE using TEST PATTERN of SERVICE MODE. Check the screen conditions and basic functions.

9-2. Representative Symptoms When Each PCB Breaks Down.

(1) Symptoms of POWER PCB Trouble
<Symptom.1> Not even weak discharge (luminescence) shows on screen.
<Symptom.2> Discharge (luminescence) on screen is unstable
<Symptom.3> Set is producing unusual noise
<Symptom.4> POWER SHUT DOWN occur (refer to Service Manual I. 9-3)

(2) Symptoms of VIDEO or JACK PCB Trouble
<Symptom.1> Only weak discharge (luminescence) shows on screen, but No Data is on screen
<Symptom.2> Screen DATA is abnormal
<Symptom.3> Particular input signal (Video, PC or Component etc.) does not operate

<Symptom.4> No SOUND
<Symptom.5> The Set does not operate normally. But, after turn off AC Power, if turn on again, it operates normally again.
<Symptom.6> Remote Control or KEY does not operate
<Symptom.7> POWER SHUT DOWN occur (refer to Service Manual I. 9-3)

(3) Representative Symptoms caused by bad Connection between PCBs.
[Note] Dust or extraneous materials is most likely to cause bad connection. Most of this case, it can be solved if using soft brush, AIR FRESHER, or breath to clean dust or extraneous materials or reassembling the Connector.

* Refer to Chapter II for Symptoms of other parts with exception of VIDEO, JACK PCB and POWER PCB Trouble.

9-3. Trouble Diagnosis and Repairing Method for Representative Symptoms
(1) When POWER SHUT DOWN occurs
<1> Definition of "SHUT DOWN"
- When LED color is green, you can't hear power operating sound. (Red : STAND BY, Green : Operating)
- When turn on AC switch and then push "POWER" button of remote controller, power relay do not operate normally, and POWER operating sound can not be detected.
<2> Trouble Repairing Procedure
- As shown in Fig. 5, first check which of "LOW VOLTAGE" part or "HIGH VOLTAGE" part has a trouble.
- If "LOW VOLTAGE" part is broken is checked, as shown in Fig. 6 diagnose the SET and then replace the broken PCB.
- If "HIGH VOLTAGE" part is broken is checked, as shown in Fig. 7 diagnose the SET and then replace the broken PCB.
- <Note.1> When disconnecting/connecting connectors, you must turn "OFF" the AC power and check the direction/position of them before working.
- <Note.2> If you turn the SET "ON" with POWER CONNECTORS of Z-SUS PCB and Y-SUS PCB (P101A, P102A, P103A) disconnected, although you turn the SET "OFF" again, Remaining Voltage still exists in the POWER PCB. Therefore assemble the connectors several minutes after. Or, check the Remaining Voltage (Vsus, Vadd) by multimeter. If Vsus is less 10V, connect connectors. Connecting connectors with the Remaining Voltage (Vsus, Vadd) over 10V could generate sparks and be dangerous to Operators or SET.

(2) When weak Discharge exists on screen but "OSD screen" can not be seen

<1> Definition of this symptom
- When the set was turned on, screen is BLACK but Weak Discharge (luminescence) exists.
- When OSD does not show on screen and the set does not respond to remote controller or KEY panel's any button.
<2> PCB CHECK PRIORITY
- VIDEO PCB

<3> Trouble Repairing Procedure
- If no problem in Connection(VIDEO PCB ==>CONTROLLER PCB), replace VIDEO PCB

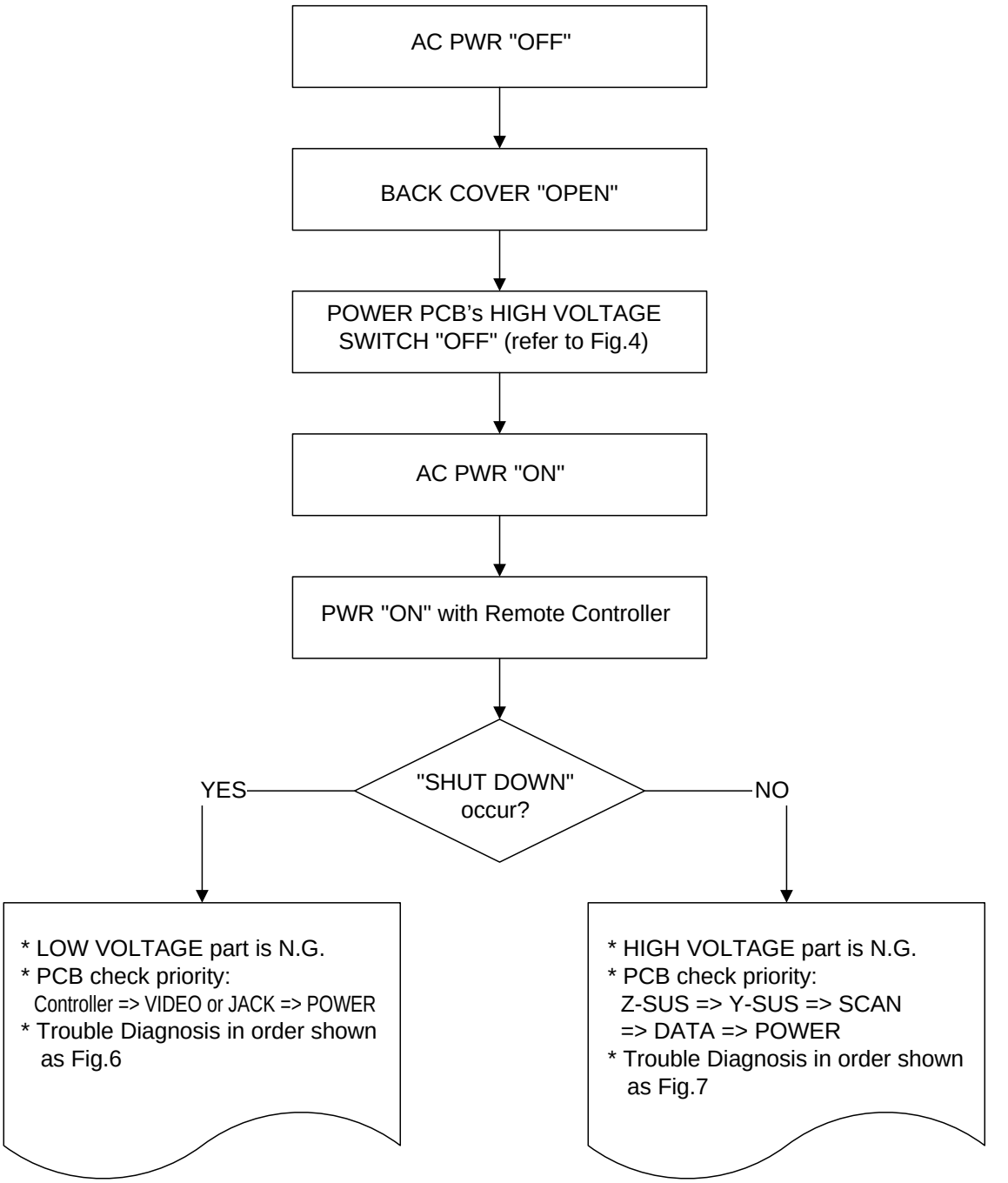

AC PWR "OFF"
BACK COVER "OPEN"
POWER PCB's HIGH VOLTAGE SWITCH "OFF" (refer to Fig.4)
AC PWR "ON"
PWR "ON" with Remote Controller
"SHUT DOWN" occur?
YES
NO
* LOW VOLTAGE part is N.G.
* PCB check priority:
Controller => VIDEO or JACK => POWER
* Trouble Diagnosis in order shown as Fig.6
* HIGH VOLTAGE part is N.G.
* PCB check priority:
Z-SUS => Y-SUS => SCAN => DATA => POWER
* Trouble Diagnosis in order shown as Fig.7

Fig. 5 Trouble Diagnosis Flow when "SHUT DOWN" occurs

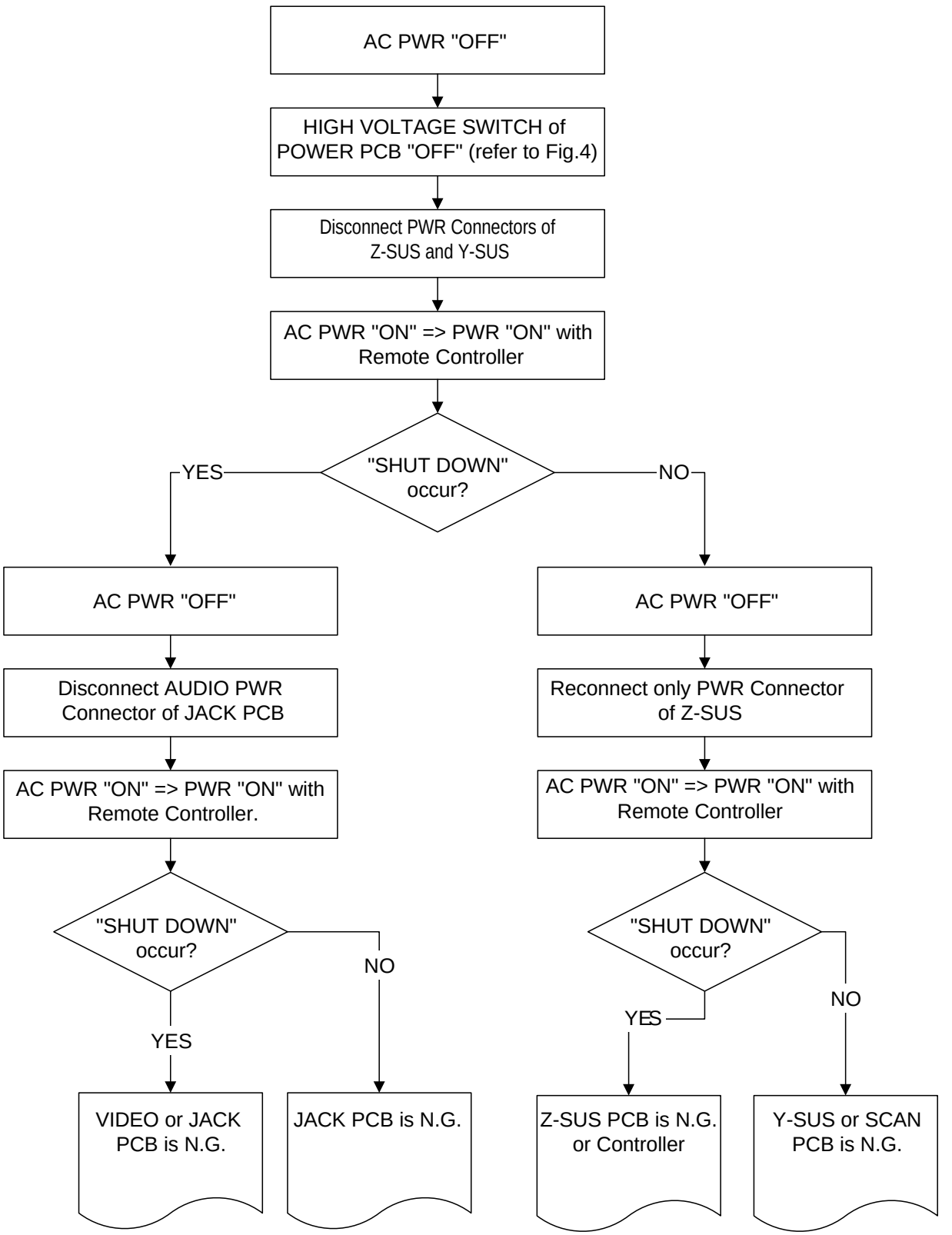

AC PWR "OFF"
HIGH VOLTAGE SWITCH of POWER PCB "OFF" (refer to Fig.4)
Disconnect PWR Connectors of Z-SUS and Y-SUS
AC PWR "ON" => PWR "ON" with Remote Controller
"SHUT DOWN" occur?
YES
NO
AC PWR "OFF"
Disconnect AUDIO PWR Connector of JACK PCB
AC PWR "ON" => PWR "ON" with Remote Controller.
"SHUT DOWN" occur?
YES
NO
VIDEO or JACK PCB is N.G.
JACK PCB is N.G.
AC PWR "OFF"
Reconnect only PWR Connector of Z-SUS
AC PWR "ON" => PWR "ON" with Remote Controller
"SHUT DOWN" occur?
YES
NO
Z-SUS PCB is N.G. or Controller
Y-SUS or SCAN PCB is N.G.

Fig. 6 Trouble Diagnosis Flow when LOW VOLTAGE "SHUT DOWN" occurs

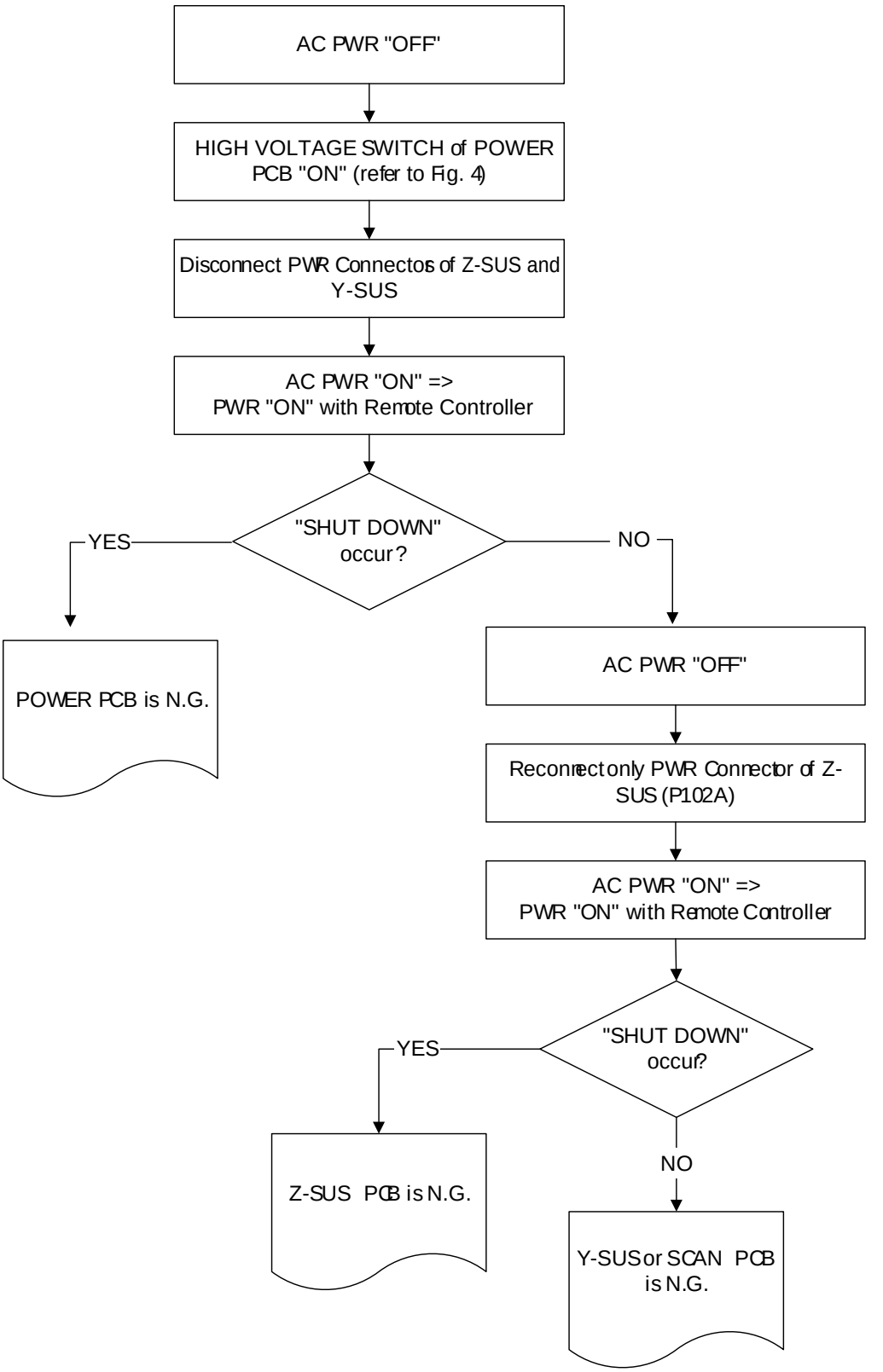

AC PWR "OFF"
HIGH VOLTAGE SWITCH of POWER PCB "ON" (refer to Fig. 4)
Disconnect PWR Connectors of Z-SUS and Y-SUS
AC PWR "ON" => PWR "ON" with Remote Controller
"SHUT DOWN" occur?
YES
NO
POWER PCB is N.G.
AC PWR "OFF"
Reconnect only PWR Connector of Z-SUS (P102A)
AC PWR "ON" => PWR "ON" with Remote Controller
"SHUT DOWN" occur?
YES
NO
Z-SUS PCB is N.G.
Y-SUS or SCAN PCB is N.G.

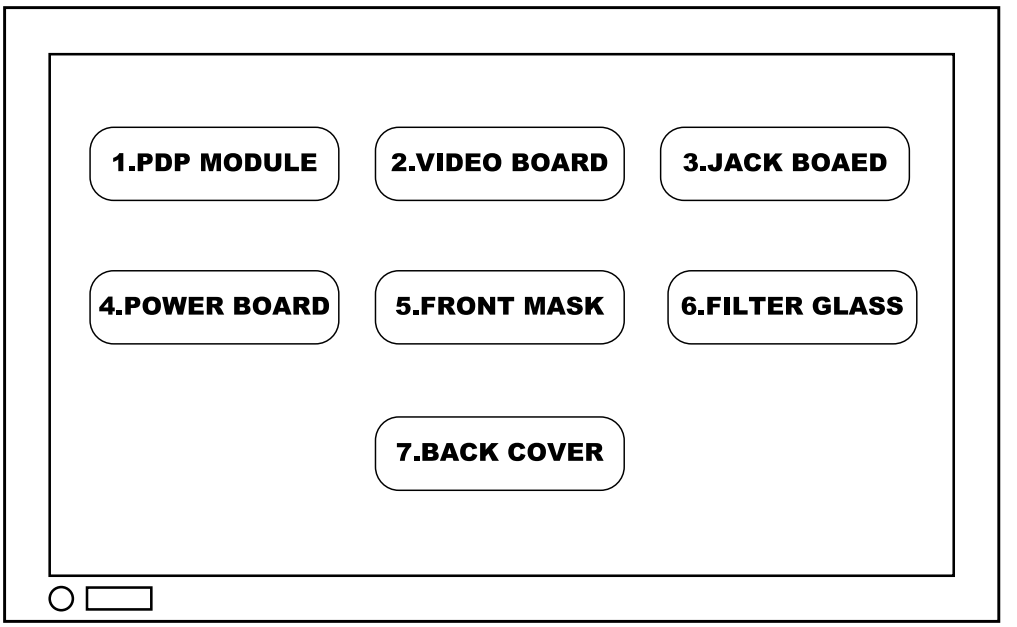
Fig. 7 Trouble Diagnosis Flow when HIGH VOLTAGE "SHUT DOWN" occurs

10. ASSEMBLY LIST

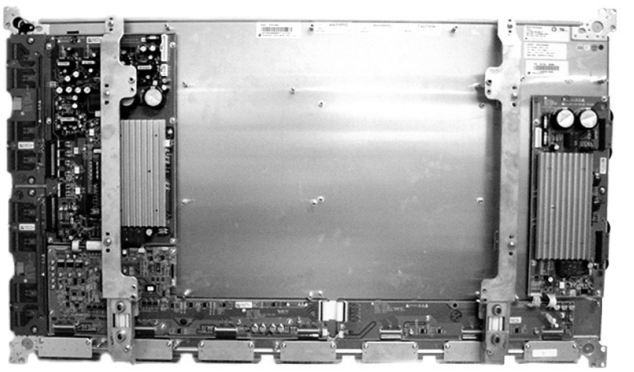
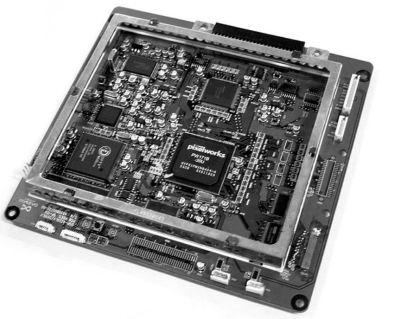
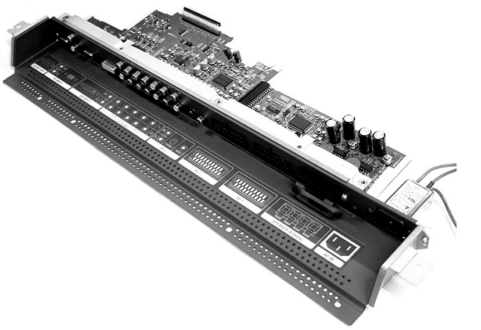
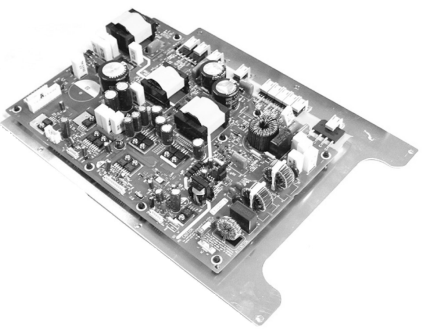
No.	PCB ASS'Y NAME	ASS'Y CORD	ASS'Y DESCRIPTION
1	VIDEO PCB AS	PTVDMSG033	PCB VIDEO MANUAL AS
2	JACK PCB AS	PTJAMSG034	PCB JACK MANUAL AS
3	MODULE PDP	4850M06410	PDP42V50011
4	MODULE POWER	4850M06310	PDD-422
5	CTRL PCB ASS'Y	485AS01690	CTRL PCB AS(PDP42V50011 LG)
6	Y-SUS PCB ASS'Y	485AS01691	Y-SUS PCB AS(PDP42V50011 LG)
7	Z-SUS PCB ASS'Y	485AS01692	Z-SUS PCB AS(PDP42V50011 LG)
8	YDRV-UPPER PCB ASS'Y	485AS01693	YDRV-UPPER PCB AS(PDP42V50011 LG)
9	YDRV-LOWER PCB ASS'Y	485AS01694	YDRV-LOWER PCB AS(PDP42V50011 LG)
10	X-RIGHT PCB ASS'Y	485AS01695	X-RIGHT PCB AS(PDP42V50011 LG)
11	PANEL GLASS	485AS01696	PANEL GLASS AS(PDP42V50011 LG)
12	CONNECTOR	4850710S06	GP390-10S+GP390-10S+ULW=400
13	CONNECTOR	4850708S11	1-1123723-8+1-1123723-8+ULW=500
14	CONNECTOR	4850704S48	GP390-04S+GP390-04S+ULW=400
15	CONNECTOR	4850710N08	YMH025-10R+YMT025R+ULW=500
16	CONNECTOR	4850705N27	YMH025-05R+YMT025R+ULW=500
17	CONNECTOR	4850708S12	12505HS-08+12505HS-08+ULW=700
18	CONNECTOR	4850705N28	12505HS-05+12505TS+ULW=900
19	CONNECTOR	4850704N28	YMH025-04R+YMT025R+ULW=400
20	CABLE LVDS AS	4859001660	GT121-31S+5010LX=450
21	BACK COVER	4851413400	DSP-4220LV
22	FILTER GLASS	485A100380	PDF-96J06

* Refer to "5. Block Diagram of Module" of Chapter II for connectors (CN1~CN6) of module parts except above list (12~19).

1. STRUCTURE OF PDP SET

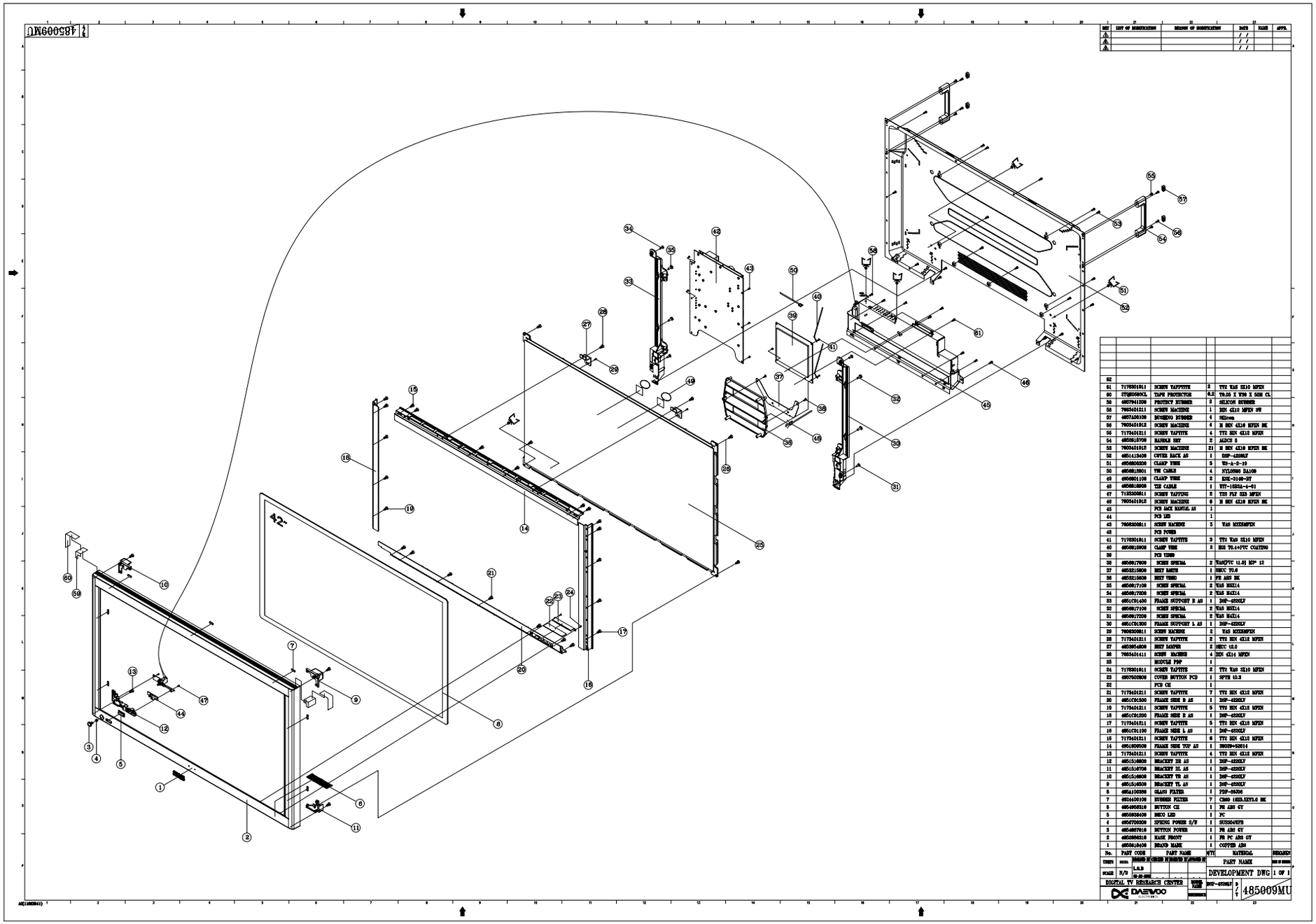


ASSEMBLY LIST

COMPONENTS	PICTURE	REMARK
1) PDP MODULE (with F/SUPPORT)		
2) VIDEO BOARD		
3) JACK BOARD (with JACK PLATE)		
4) POWER BOARD		

COMPONENTS	PICTURE	REMARK
5) FRONT MASK		
6) FILTER GLASS		
7) BACK COVER		

11. EXPLODED VIEW



II. Parts of MODULE

1. Safety Precautions

PDP Module is a display device to be divided into a Panel part and a Drive part. The Panel part consists of Electrodes, Phosphor, various dielectrics and gas, and the Drive part includes electronic circuitry and PCB.
When using/handling this PDP Module, pay attention to the below warning and cautions.

Warning
Indicates a hazard that may lead to death or injury, if the warning is ignored and the product is handled incorrectly.

Caution
Indicates a hazard that can lead to injury or damage to property if the caution is ignored and the product is handled incorrectly.

WARNING

(1) Do not supply a voltage higher than that specified to this product. This may damage the product and may cause a fire.
(2) Do not use this product in locations where the humidity is extremely high, where it may be splashed with water, or where flammable materials surround it. Do not install or use the product in a location that does no satisfy the specified environmental conditions. This may damage the product and may cause a fire.
(3) If a foreign substance (such as water, metal, or liquid) gets inside the product, immediately turn off the power. Continuing to use the product, it is may cause fire or electric shock.
(4) If the product emits smoke, and abnormal smell, or makes an abnormal sound, immediately turn off the power. Continuing to use the product, it may cause fire or electric shock.
(5) Do not disconnect or connect the connector while power to the product is on. It takes some time for the voltage to drop to a sufficiently low level after the power has been turned off. Confirm that the voltage has dropped to a safe level before disconnecting or connecting the connector.
(6) Do not pull out or insert the power cable from/to an outlet with wet hands. It may cause electric shock.
(7) Do not damage or modify the power cable. It may cause fire or electric shock.
(8) If the power cable is damaged, or if the connector is loose, do not use the product: otherwise, this can lead to fire or electric shock.
(9) If the power connector or the connector of the power cable becomes dirty or dusty, wipe it with a dry cloth. Otherwise, this can lead to fire.
(10) PDP Module uses a high voltage (Max.450V dc). Keep the cautions concerning electric shock and do not touch the Device circuitry when handling the PDP Unit. And because the capacitor of the Device circuitry may remain charged at the moment of Power OFF, standing by for 1 minute is required in order to touch the Device circuitry.

CAUTIONS

(1) Do not place this product in a location that is subject to heavy vibration, or on an unstable surface such as an inclined surface. The product may fall off or fall over, causing injuries.
(2) Before disconnecting cable from the product, be sure to turn off the power. Be sure to hold the connector when disconnecting cables. Pulling a cable with excessive force may cause the core of the cable to be exposed or break the cable, and this can lead to fire or electric shock.
(3) This product should be moved by two or more persons. If one person attempts to carry this product alone, he/she may be injured.

(4) This product contains glass. The glass may break, causing injuries, if shock, vibration, heat, or distortion is applied to the product.
(5) The temperature of the glass of the display may rise to 80˚C or more depending on the conditions of use. If you touch the glass inadvertently, you may be burned.
(6) If glass surface of the display breaks or is scratched, do not touch the broken pieces or the scratches with bare hands. You may be injured.
(7) PDP Module requires to be handled with care not to be touched with metal or hard materials, and must not be stressed by heat or mechanical impact.
(8) There are some exposed components on the rear panel of this product. Touching these components may cause an electric shock.
(9) When moving the product, be sure to turn off the power and disconnect all the cables. While moving the product, watch your step. The product may be dropped or all, leading to injuries of electric shock.
(10) In order to protect static electricity due to C-MOS circuitry of the Drive part, wear a wrist band to protect static electricity when handling.
(11) If cleaning the Panel, wipe it with a soft cloth moistened with water or a neutral detergent and squeezed, being careful not to touch the connector part of the Panel. And don't use chemical materials like thinner or benzene.
(12) If this product is used as a display board to display a static image, "image sticking" occurs. This means that the luminance of areas of the display that remain lit for a long time drops compared with luminance of areas that are lit for a shorter time, causing uneven luminance across the display. The degree to which this occurs is in proportion to the luminance at which the display is used. To prevent this phenomenon, therefore, avoid static images as much as possible and design your system so that it is used at a low luminance, by reducing signal level difference between bright area and less bright area through signal processing.
(13) Because PDP Module emits heat from the Glass Panel part and the Drive circuitry, the environmental temperature must not be over 40˚C. The temperature of the Glass Panel part is especially high owing to heat from internal Drive circuitry. And because the PDP Module is driven by high voltage, it must avoid conductive materials.
(14) If inserting components or circuit board in order to repair, be sure to fix a lead line to the connector before soldering.
(15) If inserting high-power resistor (metal-oxide film resistor or metal film resistor) in order to repair, insert it as 10mm away as from a board.
(16) During repairs, high voltage or high temperature components must be put away from a lead line.
(17) This is a Cold Chassis but you had better use a cold transformer for safety during repairs. If repairing electricity source part, you must use the cold transformer.
(18) Do not place an object on the glass surface of the display. The glass may break or be scratched.
(19 This product may be damaged if it is subject to excessive stresses (such as excessive voltage, current, or temperature). The absolute maximum ratings specify the limits of these stresses.
(20) The recommended operating conditions are conditions in which the normal operation of this product is guaranteed. All the rated values of the electrical specifications are guaranteed within these conditions. Always use the product within the range of the recommended operating conditions. Otherwise, the reliability of the product may be degraded.
(21) This product has a glass display surface. Design your system so that excessive shock and load are not applied to the glass. Exercise care that the vent at the corner of the glass panel is not damaged. If the glass panel or vent is damaged, the product is inoperable.

(22) Do not cover or wrap the product with a cloth or other covering while power is supplied to the product.
(23) Before turning on power to the product, check the wiring of the product and confirm that the supply voltage is within the rated voltage range. If the wiring is wrong or if a voltage outside the rated range is applied, the product may malfunction or be damaged.
(24) Do not store this product in a location where temperature and humidity are high. This may cause the product to malfunction. Because this product uses a discharge phenomenon, it may take time to light (operation may be delayed) when the product is used after it has been stored for a long time. In this case, it is recommended to light all cells for about 2 hours (aging).
(25) This product is made from various materials such as glass, metal, and plastic. When discarding it, be sure to contact a professional waste disposal operator.
(26) If faults occur due to arbitrary modification or disassembly, LG Electronics is not responsible for function, quality or other items.
(27) Use of the product with a combination of parameters, conditions, or logic not specified in the specifications of this product is not guaranteed. If intending to use the product in such a way, be sure to consult LGE in advance.
(28) Within the warranty period, general faults that occur due to defects in components such as ICs will be rectified by LGE without charge. However, IMAGE STICKING due to misapplying the above (12) provision is not included in the warranty. Repairs due to the other faults may be charged for depending on responsibility for the faults.

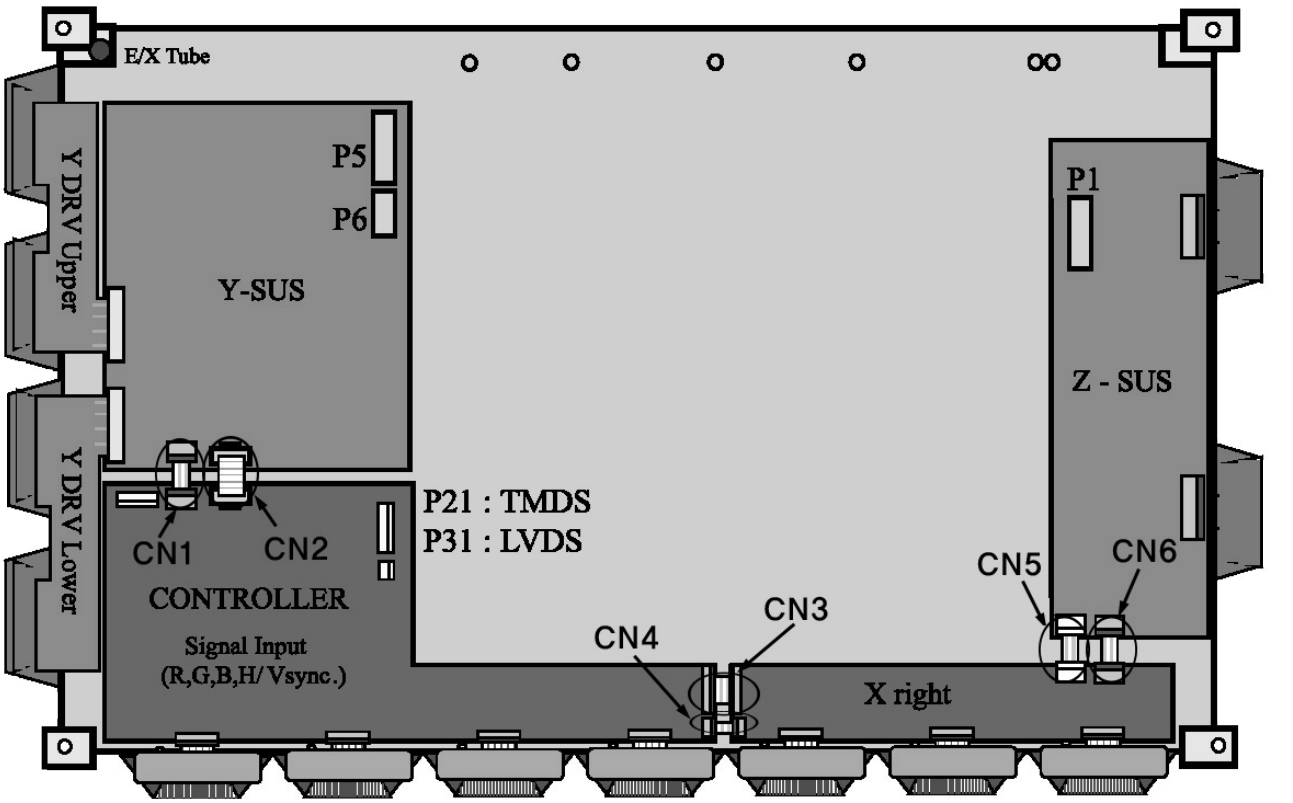


Fig. 8 Connection diagram

External Cable Connection

NO	Connector	Input Signal
1	P1[Z SUS B/D]	5V, Va, Vs
2	P5[Y SUS B/D]	5V, Vs
3	P6[Y SUS B/D]	5V
4	P21, P31[CTRL B/D]	Video Signal

NO	Part No.		Description
1	6871QCH025A	PWB(PCB) ASSY	TMDS CTRL B/D ASSY
2	6871QCH029A	PWB(PCB) ASSY	LVDS CTRL B/D ASSY
3	6871QDH051A	PWB(PCB) ASSY	Y DRV UPPER B/D ASSY
4	6871QDH052A	PWB(PCB) ASSY	Y DRV LOWER B/D ASSY
5	6871QRH034A	PWB(PCB) ASSY	X RIGHT B/D ASSY
6	6871QYH027A	PWB(PCB) ASSY	Y SUS B/D ASSY
7	6871QZH030A	PWB(PCB) ASSY	Z SUS B/D ASSY

3. Adjustment

3-1. Application Object

This standard is applied to the PDP42V5#### PDP Module which is manufactured by the manufacturing team of PDP promotion department or elsewhere.

3-2. Notes

(1) Without any special specification, the Module should be at the condition of preliminaries more than 10minutes before adjusting.
- Service signal : 100% Full White signal
- Service DC voltage : Vcc:5V, Va:65V, Vs:190V
- DC/DC Pack voltage : Vsetup:220V, Vscw:115V,
- Ve:-35V, -Vy:-75V
- Preliminaries environment : Temp (25±5°C), Relative humidity (65±10%)

(2) Module should get the Aging for the equilibrium after finish the assembling. Aging condition is shown below.
- Service signal: 100% Full White, Red, Green, Blue pattern signal (Service time of each pattern : within minutes/cycle)
- Service DC voltage : Match the voltage with the set up voltage in the first adjustment.
- Aging time : More than 4Hrs
- Aging environment : Temp (60±2°C), Relative humidity-Less than 75%

(3) Module adjustment should be followed by below sequence.
- Setting up the initial voltage and adjusting the voltage wave form of Vsetup
- Measuring the Margin of Vs voltage and deciding the voltage
- Adjusting and checking the voltage of DC/DC pack (Vsetup, Vscw, -Ve, -Vy)
- Adjusting the voltage wave form of Vset-down
- Measuring the voltage margin of Vset-up and deciding the voltage
- Adjusting the wave form of final voltage

But, these items above can be changed by the consideration of mass production. (When changing the sequence, there should be an agreement of the Module development 2Gr/ QA Gr/ Manufacturing Gr)

(4) Without any special specification, you should adjust the Module in the environment of Temp (25±5° C) and Relative humidity (65±10%)

Caution:If you let the still image more than 10 minutes (especially The Digital pattern or Cross Hatch Pattern which has clear gradation), after image can be presented in the black level part of screen.

3-3. Adjustment items

3-3-1. Adjusting the Board Group

(1) Adjusting the voltage wave form of Vset-up
(2) Adjusting the voltage wave form of Vset-down
(3) Adjusting the voltage wave form of Vramp

3-3-2 Adjustment after assembling (PDP Module adjustment)

(1) Setting up the initial voltage and adjusting the voltage wave form of Vsetup
(2) Measuring the voltage Margin of Vs and deciding the voltage
(3) Adjusting and checking the voltage of DC/DC pack (Vsetup, Vscw, -Ve, -Vy)
(4) Adjusting the voltage wave form of Vset-down
(5) Measuring the voltage Margin of Vset-up and deciding the voltage
(6) Adjusting the wave form of final voltage

3-4. Adjusting the Board Group (Applying the Jig Set)

3-4-1. Using Tools

(1) Digital oscilloscope : More than 200MHz
(2) DVM(Digital Multimeter) : Fluke 87 or similar one
(3) Signal generator : VG-825 or similar one
(4) DC power supply
- DC power supply for Vs (1) : Should be changeable more than 0-200V/ more than 10A
- DC power supply for Va (1) : Should be changeable more than 0-100V/ more than 5A
- DC power supply for 5V (1) :Should be changeable more than 0-10V/ more than 10A
- DC-DC Convertor Jig (1) : The Jig which has voltage equivalent output of PDP42V5#### Module after taking the Vs, Va, 5V voltage.
- Voltage stability of power supply : Within ±1% for Vs/Va, within ±3% for 5V

3-4-2. Connection diagram of measuring instrument and setting up the initial voltage

(1) onnection diagram of measuring instrument Refer to Fig. 8.(Connection diagram of measuring instrument that adjusting the voltage wave form)
(2) Setting up the initial voltage Initially setting up voltage : Vcc:5V, Va:65V, Vs:190V But, Initially setting up voltage can be changed by the set up range according to the Module's characteristic.

3-4-3. How to Adjust

(1) Adjusting the Voltage Wave form of Vsetup
- Connect measuring instrument like the connection diagram Fig. 8.
- Turn on the power of the measuring instrument like the <Caution> item Fig. 8.
- Connect the oscilloscope probe to P4 connector (80 Pin) of Y-SUS PCB and GND.
- Turn the VR1 of Y-SUS PCB and make the "A" wave form Fig. 9 to be 25±5μs.

(2) Adjusting Vset-down Voltage Wave form Turn the VR2 of Y-SUS PCB and make the "B" wave form Fig. 9 to be 190±5μs.

(3) Adjusting Vramp Voltage Wave form
- Connect oscilloscope Probe to the B37(Pin) of Z PCB and the GND of PCB
- Turn the VR3 of Z PCB and make the "C" wave form Fig. 10 to be 15±2μs. But, in case of not setting up the Test point, produce same output and adjust wave form connect to other pattern or parts which has no possibility of short.

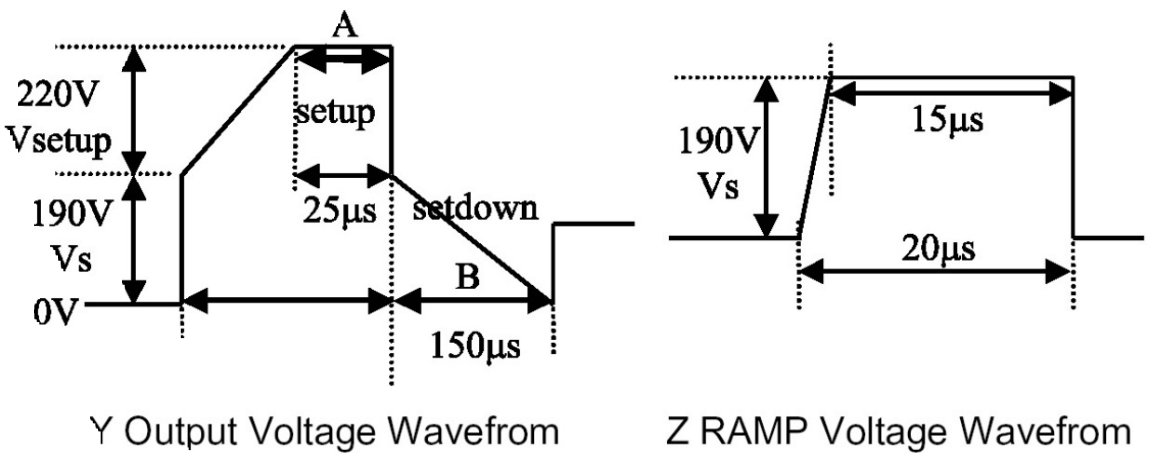


Fig. 9 Y Set-up Wave form

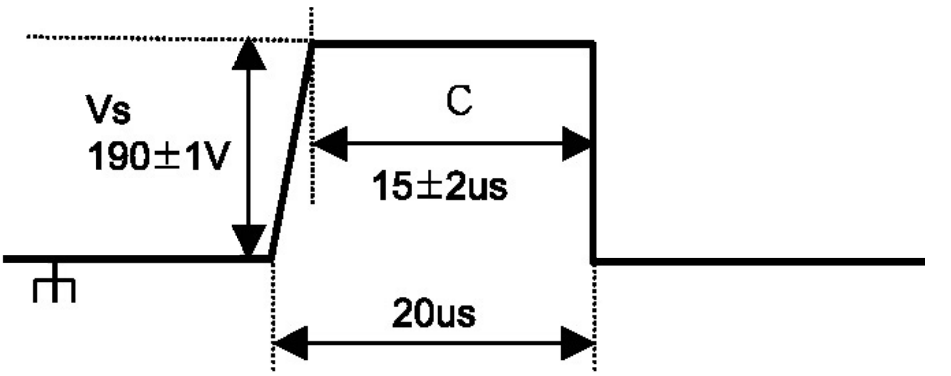


Fig. 10 Z ramp Wave form

3-5. Adjustment after Assembling (PDP Module Adjustment)

3-5-1. Using Tools

(1) Digital oscilloscope : More than 200MHz
(2) DVM(Digital Multimeter): Fluke 87 or similar one
(3) Signal generator: VG-825 or similar one
(4) DC power supply
- DC power supply for Vs (1) : Should be changeable more than 0-200V/ more than 10A
- DC power supply for Va (1) : Should be changeable more than 0-100V/ more than 5A
- DC power supply for 5V (1) : Should be changeable more than 0-10V/ more than 10A
- DC-DC Converter Jig (1) : The Jig which has voltage equivalent output of PDP42V5#### Module after taking the Vs, Va, 5V voltage
- Voltage stability of power supply : Within ±1% for Vs/Va, within ±3% for 5V

3-5-2. Connection diagram of measuring instrument and setting up the initial voltage

(1) Connection diagram of measuring instrument Refer to Fig 8. (Connection diagram of measuring instrument that adjusting the voltage wave form)
(2) Setting up the initial voltage Initially setting up voltage : Vcc:5V, Va:65V, Vs:190V But, Initially setting up voltage can be changed by the set up range according to the Module's characteristic.

3-5-3. How to Adjust

(1) Adjusting initial voltage wave form Check the voltage wave form like the mentioned way on the 3-4-3(How to adjust) and readjust the wave form when it is wrong.

(2) Checking the DC/DC pack voltage

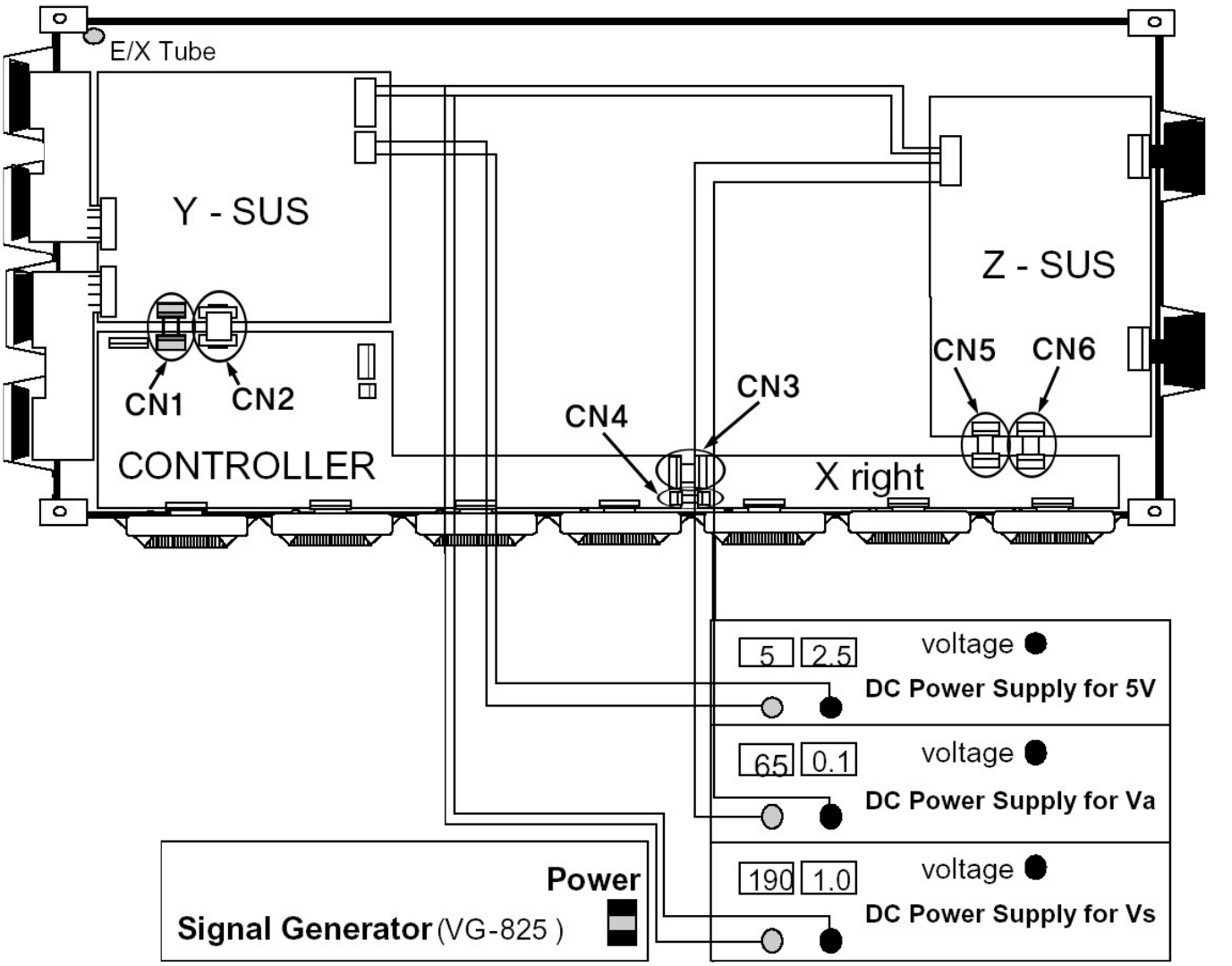
- Convert the signal of signal generator to the 100% Full White signal
- Connect the GND terminal of DVM to the GND of Y B/D and set the Plus terminal to the right up leg of R9 to check the -Ve voltage (-35 ± 1V). And when there is abnormality in voltage turn the variable resistor (VR7) of DC/DC Pack(-Ve) on Y B/D to adjust.
- Connect the GND terminal of DVM to the R60's right leg of the Y B/D and set the Plus terminal to the left leg of R60 to check the Vscw voltage(115 ± 1V) and when there is abnormality in voltage turn the variable resistor(VR5) of DC/DC Pack(Vscw) on Y B/D to adjust.
- Connect the GND terminal of DVM to the R8's right leg of the Y B/D and set the Plus terminal to the left leg of R8 to check the -Vy voltage(-80 ± 1V) and when there is abnormality in voltage turn the variable resistor(VR6) of DC/DC Pack(-Vy) on Y B/D to adjust.
- Connect the GND terminal of DVM to the R89's right leg of the Y B/D and set the Plus terminal to the left leg of R89 to check the Vsetup voltage(240 ± 1V) and when there is abnormality in voltage turn the variable resistor(VR4) of DC/DC Pack(Vsetup) on Y B/D to adjust.

(3) Measuring the Vs voltage Margin and deciding the voltage

- Convert the signal of signal generator to the 100% Full Red signal.
- Turn the voltage adjusting knob of Vs DC power supply to the voltage -down direction and make the cell of screen turned off.
- Turn the voltage adjusting knob of Vs DC power supply to the voltage -up direction until the cell of screen turned on. The first voltage, which make the cell of full screen turned on, is named as Vsmin1 and record it.
- Turn the voltage adjusting knob of Vs DC power supply to the voltage-up direction slowly until the cell of screen turned off or over electric discharge. The first voltage, which makes the cell of screen turned off or over electric discharge, is named as Vsmax1 and records it. (Only, Vs voltage variable passes over the maximum 195V)
- Convert the signal of signal generator to the 100% Full Green signal.
- Repeat the adjustment (2) item and name each voltage as Vsmin2/Vsmax2 and record them.
- Convert the signal of signal generator to 100% Full Blue signal.
- Repeat the adjustment (2) item and name each voltage as Vsmin3/Vsmax3 and record them.
- Convert the signal of signal generator to 100% Full White signal.
- Repeat the adjustment (2) item and name each voltage as Vsmin4/Vsmax4 and record them.
- Convert the signal of signal generator to 100% Full Black signal.
- Repeat the adjustment (2) item and name each voltage as Vsmin5/Vsmax5 and record them.
- At this time decided Vs voltage (Vsmin1-Vsmin5) adds 6V to Max value and set up the voltage within the set-up range($180V < Vs \leq 195V$) in consideration of other features.
- Turn the voltage adjusting knob of Vs DC power supply make deciding the Vs voltage.
- Adjust Vset down wave form using setting up Vs voltage like mentioned on the 3-4-3.

(4) Adjusting the final voltage wave form Check the voltage wave form like the mentioned way on the 3-4-3(How to adjust) and readjust the wave form when it is twisted.

(5) DC-DC Pack Voltage Set up Range
Vsetup : 210V ~ 240V
Vsc : 90V ~ 120V
-Vy : -60V ~ -80V
-Ve : -35V ~ -45V



<Caution>

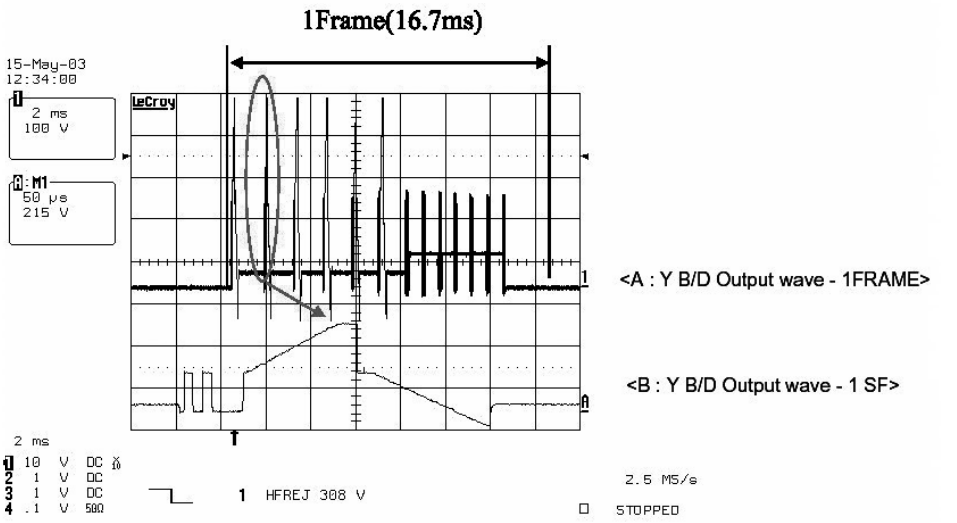
(1) The power of the signal generator should be turned on before turning on the power of DC power supply.
(2) The voltage of DC power supply , in standard of Module input voltage, should be preset as below.
Vcc: 5V, Va: 65V, Vs: 190V
(3) The power of power supply must turned on by this sequence. Reverse direction When turning off.
* Module on : 5V → Va → Vs, Module off: Vs → Va → 5V
(4) Signal generator should be selected with 852*480 mode(WVGA)

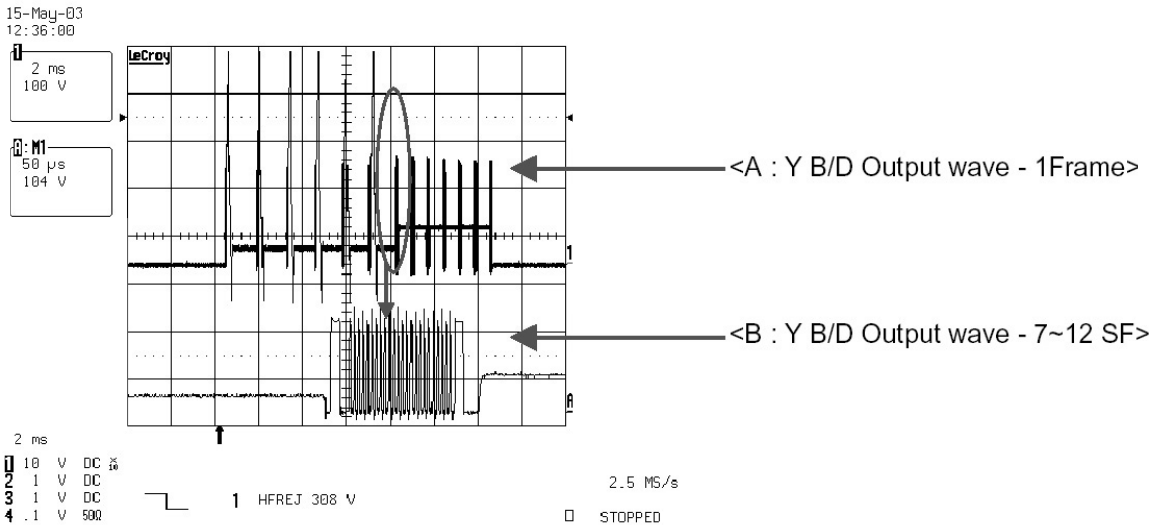
4-1. Checking for no Picture

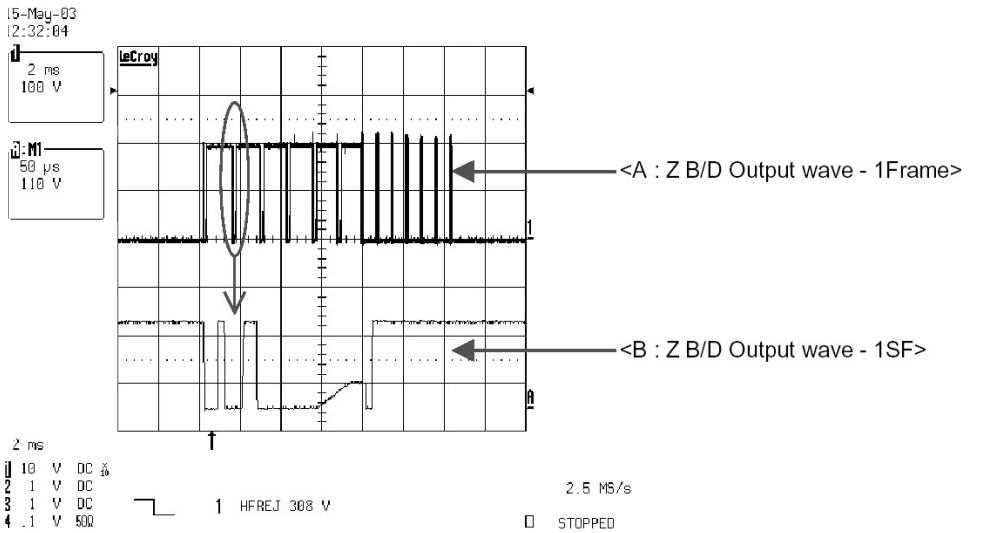
A screen doesn't not display at all and condition of black pattern or power off.

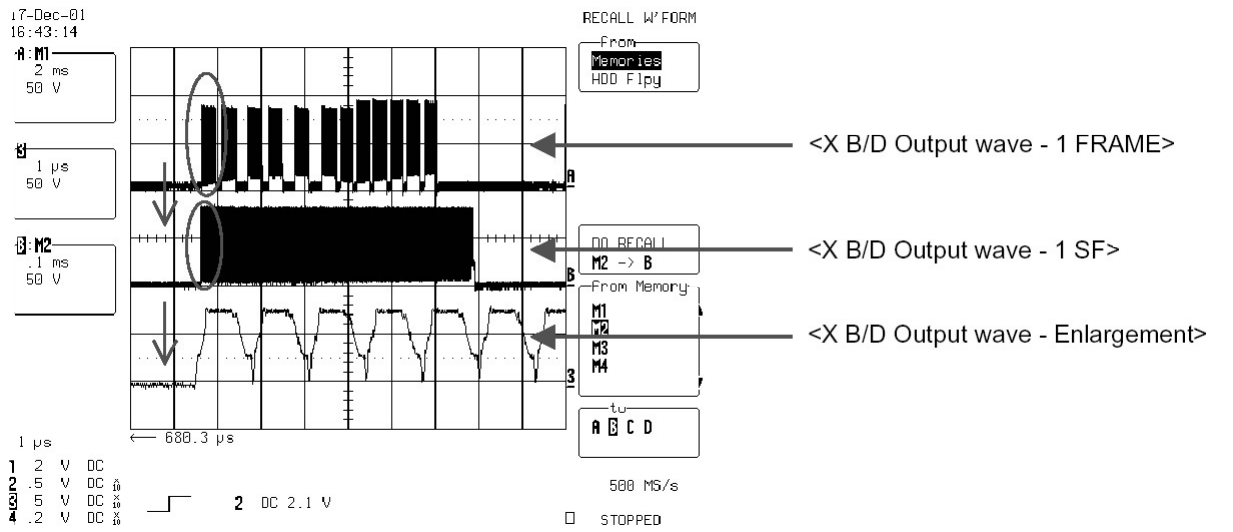
(1) Check whether the CTRL B/D LED(D1~D4) is turned on or not.
(2) Check the power and signal cable of CTRL B/D.
(3) X B/D, Y B/D, Z B/D is well plugged in.
(4) Check the connection of X B/D, Y B/D and Z B/D to CTRL B/D.
(5) Measure the output wave of X, Y, Z B/D with oscilloscope (more than 200MHz) and find the trouble of B/D by comparing the output wave with below figure.
- Measure Point fo Y B/D : TP (Connector P4 80 pin)
- Measure Point fo Z B/D : Connection part of panel (SUS_OUT)
- Measure Point fo X B/D : L1(RIGHT), L2(LEFT BOTTOM)

(6) Check the SCAN(Y side) IC
(7) Check the DATA(X side) COF IC
(8) Replace the CTRL B/D.




15-May-03
12:36:00
LeCroy
2 ms
100 V
M1
50 µs
104 V
<A : Y B/D Output wave - 1Frame>
<B : Y B/D Output wave - 7~12 SF>
2 ms
10 V DC
1 V DC
1 V DC
.1 V 50Ω
1 HFREJ 308 V
2.5 MS/s
STOPPED


15-May-03
12:32:04
LeCroy
2 ms
100 V
M1
50 µs
110 V
<A : Z B/D Output wave - 1Frame>
<B : Z B/D Output wave - 1SF>
2 ms
10 V DC
1 V DC
1 V DC
.1 V 50Ω
1 HFREJ 308 V
2.5 MS/s
STOPPED


17-Dec-01
16:43:14
A:M1
2 ms
50 V
B
1 µs
50 V
M2
.1 ms
50 V
RECALL W'FORM
From
Memories
HDD Flpy
DO RECALL
M2 -> B
From Memory
M1
M2
M3
M4
to
A B C D
<X B/D Output wave - 1 FRAME>
<X B/D Output wave - 1 SF>
<X B/D Output wave - Enlargement>
680.3 µs
1 µs
2 V DC
.5 V DC
5 V DC
.2 V DC
2 DC 2.1 V
500 MS/s
STOPPED

4-2. Hitch Diagnosis Following Display Condition

4-2-1. 4/7 or 3/7 of the screen doesn't be shown

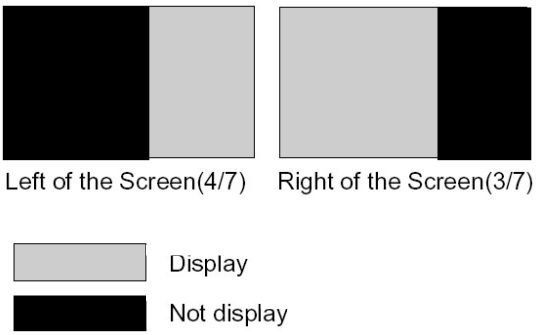
(1) Confirm the power connector of X B/D is well plugged in which is correspond to not showing screen.

(2) Confirm the connector that is connected between CTRL B/D and X B/D correspond to not showing part.

(3) Replace relevant X B/D.

* Relationship between screen and X B/D
  Screen X B/D
  Left of the Screen 4/7 <--> Right X B/D
  Right of the Screen 3/7 <--> Left X B/D

* Screen Display Form



4-2-2. The screen doesn't be shown as Data COF

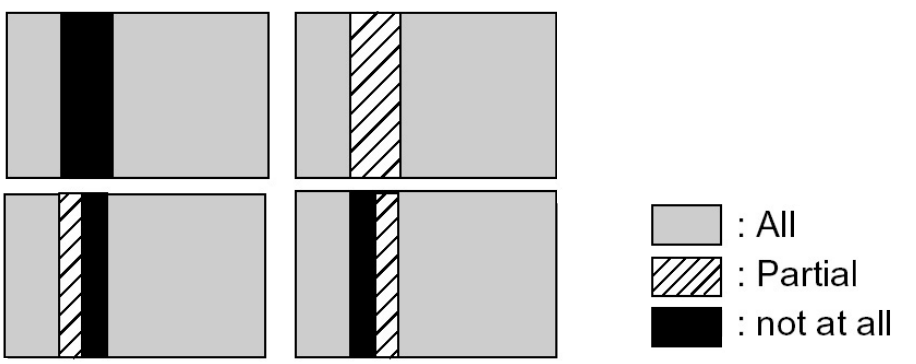
(Include not be shown part of Data COF quantity or a part)

(1) The problem between Data COF and X B/D is more possible that the screen is not be shown as data COF.

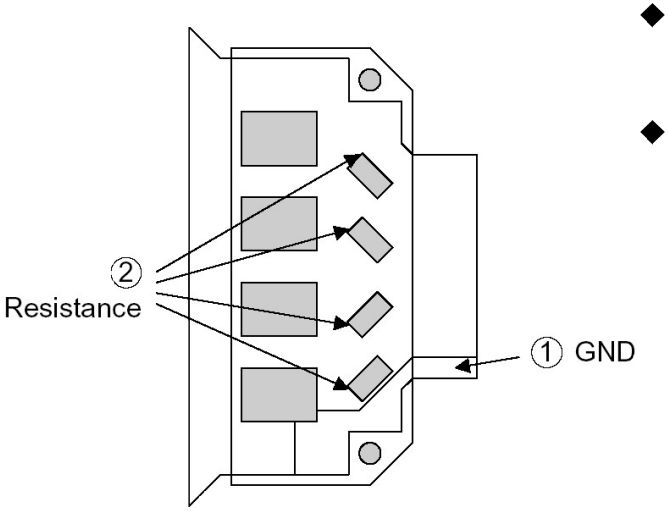
(2) Confirm the connector of Data COF is well connected to X B/D. Correspond to the part that screen is not showing

(3) Confirm whether the Data COF is failed and replace X B/D

* Example of the screen display form
  (Anything of the 7 Data COF can be shown beside below pictures)



* How to examine Data COF IC



- ◆ ① ANODE Pattern (GND)
  ② CATHOD Pattern and examine the Diode to the pure or reverse direction.
- ◆ Measure the third resistance value

* How to examine Data COF IC

4-2-3. It Generates Unusual Pattern of Data COF IC unit

(1) In case of generating unusual pattern of Data COF IC unit as below picture, there is problem in the check that is input into Data COF IC

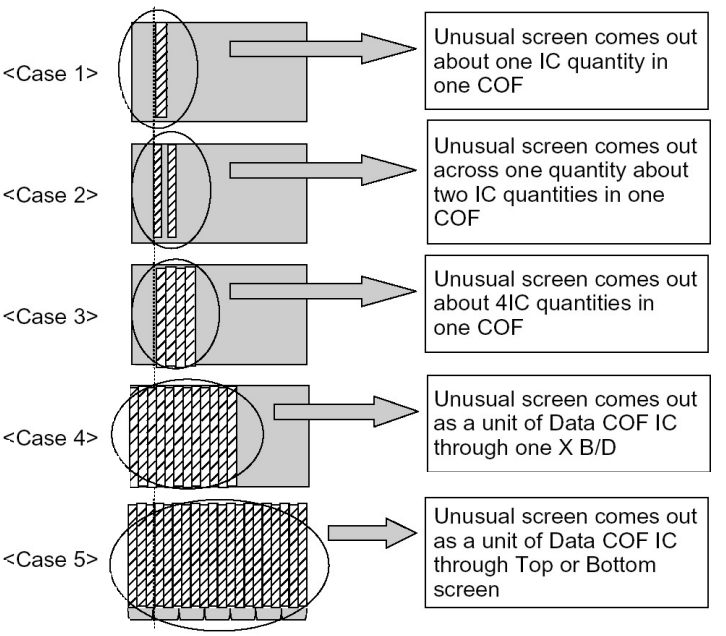
(2) In case of <case 1, 2, 3>

- confirm the connection of Data COF connector
- replace the relevant X B/D

(3) In case of <case 4, 5>

- confirm the connector that is connected from CTRL to X B/D
- Replace relevant XB/D or CTRL B/D

* Screen Display Form


<Case 1>
Unusual screen comes out about one IC quantity in one COF
<Case 2>
Unusual screen comes out across one quantity about two IC quantities in one COF
<Case 3>
Unusual screen comes out about 4IC quantities in one COF
<Case 4>
Unusual screen comes out as a unit of Data COF IC through one X B/D
<Case 5>
Unusual screen comes out as a unit of Data COF IC through Top or Bottom screen

4-2-4. Regular Stripe is Generated about the Quantity of one Data COF IC or more

(1) In case of generating regular stripe about the quantity of one Data COF IC, there is problem at the output of output flatworm of X B/D. In case of generating regular stripe about the quantity of two Data COF ICs, that means the data which is conveyed from CTRL B/D is not conveyed well.

(2) Confirm the XB/D connection connector plugged in well. Correspond to unusual screen.

(3) Replace relevant XB/D or CTRL B/D.

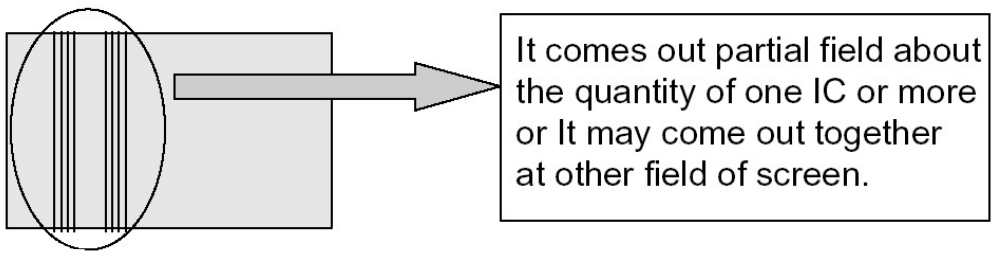
* Relationship between screen and X B/D

Screen X B/D

Left Bottom of the Screen 4/7 <--> Right X B/D

Right Bottom of the Screen 3/7 <--> Left X B/D

* Screen Display Form



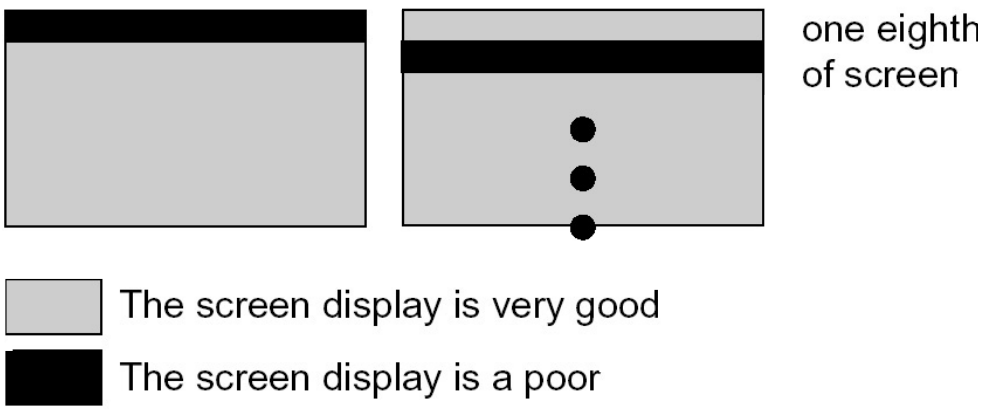
4-2-5. The screen display has a problem for Scan FFC.

(1) It's may be a problem between Scan FFC and Y B/D.

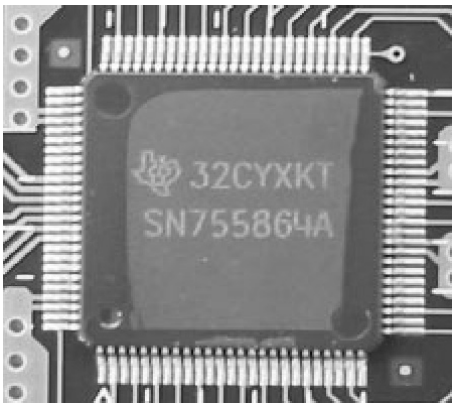
(2) Check the connection of Y B/D and Scan COF.

(3) If the Scan IC is failed, replace the Y DRV B/D.

* Screen Display Form



* Check a method of SCAN IC



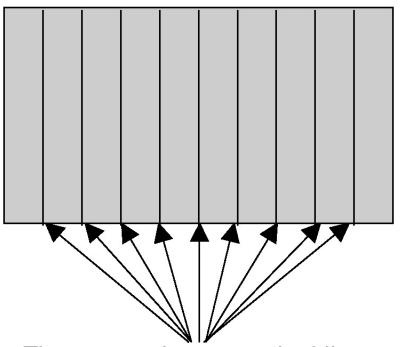
Change the Vpp Pin into ANODE and GND Pin into CATHOD and then test the Diode with forward or reverse direction.

4-2-6. The screen has a vertical line with regular gap. (A vertical stripe flash at especial color)

(1) This is a problem about control B/D.

(2) Replace Control B/D.

* Screen Display Form

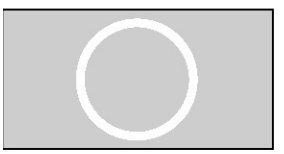


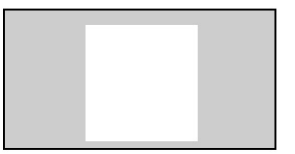
4-2-7. A data copy is happened into vertical direction

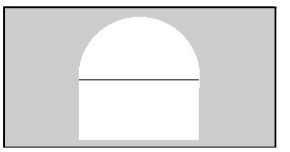
(1) In this case, it's due to incorrect marking of scan wave.

(2) Replace a Y DRV B/D or Y SUS B/D.

* Screen Display Form







4-2-8. The screen has one or several vertical line

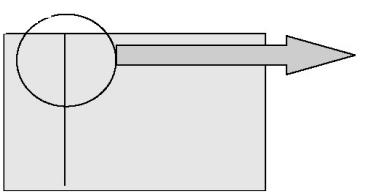
(1) In this case, It isn't a problem about controller B/D or XB/D.

(2) It may cause followings.

- It's out of order a panel
- Open or short of DATA COF FPC attached panel
- It's out of order a DATA COF attached panel

(3) Replace Module.

* Screen Display Form



It may show several vertical lines in a quarter or other division part of screen including left case.

4-2-9. The screen has one or several horizontal line

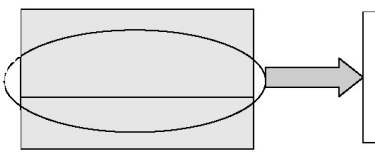
(1) In this case, it isn't a problem about controller B/D or XB/D.

(2) It may cause followings.

- It's out of order a panel
- Open or short of SCAN FPC attached panel
- It's out of order a SCAN IC attached panel

(3) Replace Y DRV B/D

* Screen Display Form



It may show several horizontal lines including left case.

4-2-10. The screen displays input signal pattern but the brightness is dark

(1) In this case, Z B/D operation isn't complete.

(2) Check the power cord of Z B/D.

(3) Check the connector of Z B/D and Controller B/D.

(4) Replace the Controller B/D or Z B/D.

4-2-11. The screen displays other color partially on full white screen or happens discharge partially on full black screen.

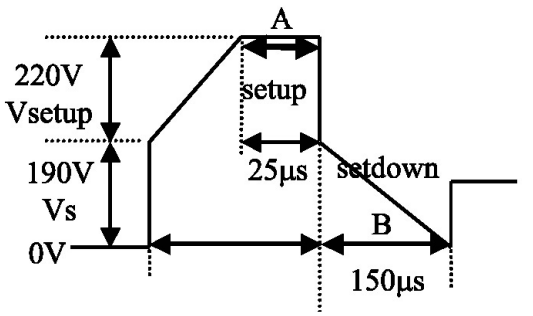
(1) Check the declination of Y B/D set up, set down wave.

(2) Check the declination of Z B/D ramp wave.

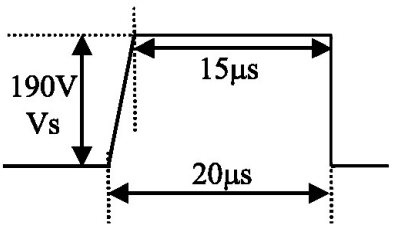
(3) Measure each output wave with oscilloscope (more than 200MHz) and compare the data with below figure data.

Adjust the Y B/D set up(Test-up:B/C[㎲/㎲] - VR1)/setdown(Test-down:D[㎲] - VR2) and Z B/D ramp(Tramp:F/G[㎲/㎲] - VR3) declination by changing VR1/VR2/VR3.

- Measuring Point of Y B/D : P4 (Connector P4 36 pin)
- Measuring Point of Z B/D : B37 (SUS_OUT)



Y Output Voltage Wavefrom



Z RAMP Voltage Wavefrom

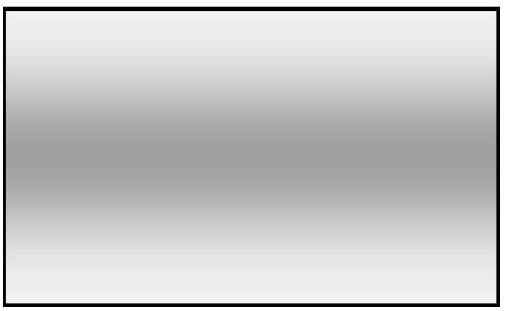
4-2-12. A center of screen is darker than a edge of screen at full white pattern.

(1) In this case, it's a problem about Z B/D ramp wave.

(2) Check the connection cable of Z B/D and CTRL B/D.

(3) Replace the Z B/D.

* Screen Display Form

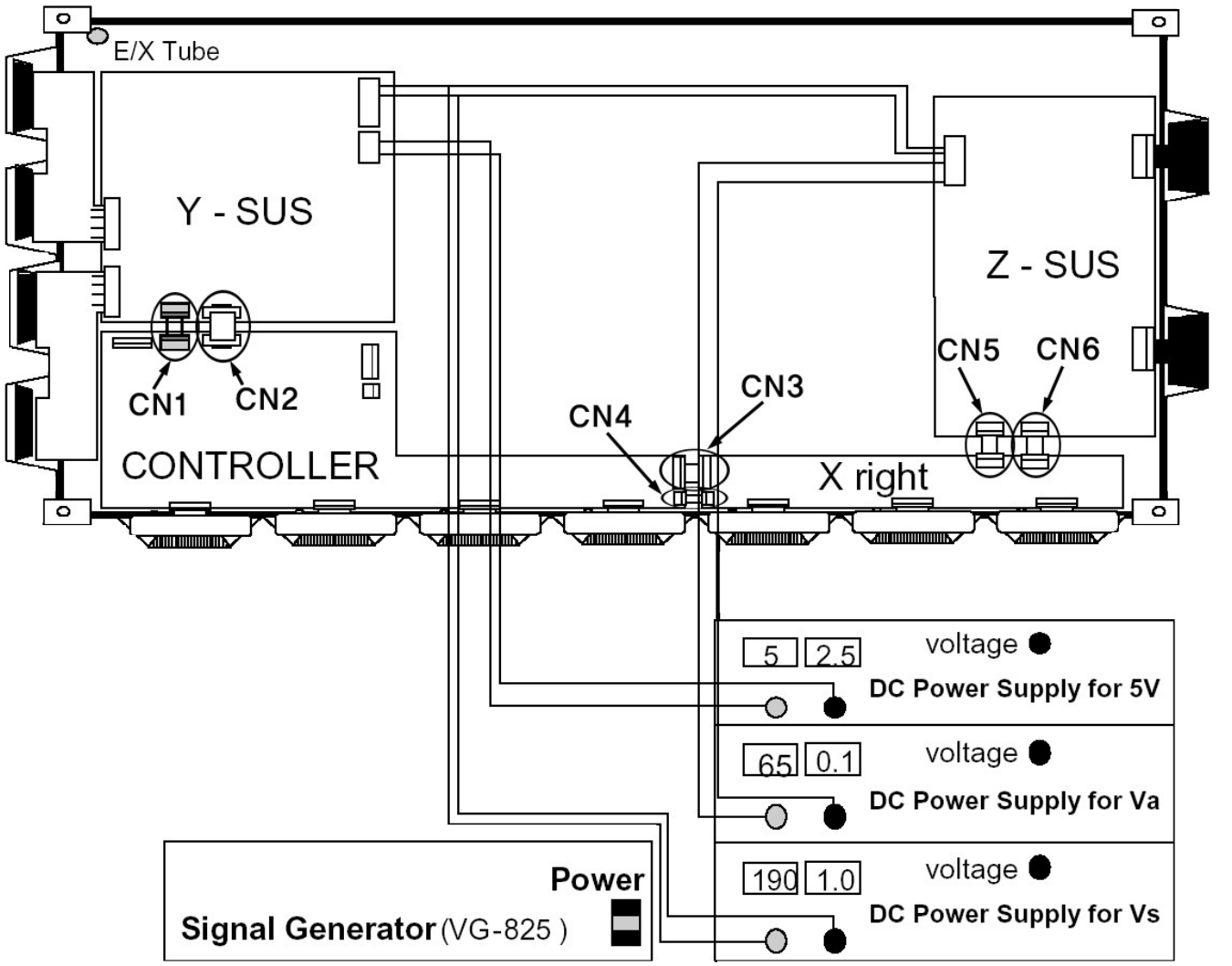


4-2-13. It doesn't display a specified brightness at specified color

(1) Check the connector of CTRL B/D input signal.

(2) Replace the CTRL B/D.

5. Block Diagram of Module



DAEWOO

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